

## ABSTRACT

Title of dissertation: WHAT CAN I DO? PRESERVICE ELEMENTARY  
TEACHERS DEVELOPING UNDERSTANDINGS OF  
SELF AS MATHEMATICS TEACHER AND  
TEACHING IN CONTEXT

Jill Marie Neumayer DePiper, Doctor of Philosophy, 2012

Dissertation directed by: Assistant Professor Ann Edwards  
Department of Curriculum and Instruction

In order to prepare preservice teachers (PSTs) to enact teaching practices that best support all students in learning mathematics, elementary mathematics teacher education must prepare PSTs to navigate the many social, political, and institutional dynamics in today's classrooms. In this research, I theorized that successful negotiation of these dynamics requires that teachers have an understanding of themselves as mathematics teachers, including an examined vision of their goals of mathematics teaching, the social and political contexts of schooling, and the realities of their school contexts. In this study, I explored how PSTs understood themselves as mathematics teachers and teaching through participation in a seminar designed to support critical examination of themselves as mathematics teachers, particularly as within complex realities of schooling and attention to equity and access.

The theoretical perspective of performativity (Butler, 1999) was used to understand and support PST identity work and specifically guided the design of the

seminar and the case analysis. Each of the four cases offers a unique perspective on how PSTs understood themselves as mathematics teachers and mathematics teaching and how these understandings shifted. The first of three findings across the cases was that PSTs understood themselves and their teaching differently. Specifically, as articulated in the second finding, they understood teaching for equity differently and in relation to their own self-understandings. The third finding is that PSTs' understandings of themselves as mathematics teachers and mathematics teaching shifted. Thus, understanding PSTs' mathematics teacher identities through a theoretical premise of performativity and supporting PSTs in deconstructing these contexts, expectations, and constraints supported some PSTs in repositioning themselves in relation to dominant discourses that framed their understandings of mathematics teaching and in problematizing mathematics teaching. These findings have implications for mathematics teacher education, offering new tools and specific concrete resources to support mathematics teacher critical self-examination. Findings also suggest the need for PSTs to engage in continued identity work and in facilitated opportunities to work at the intersections of mathematics teaching with issues of race, class, and institutional discourses of testing. Further research on operationalizing a critical pedagogy in mathematics teacher education is also needed.

WHAT CAN I DO? PRESERVICE ELEMENTARY TEACHERS DEVELOPING  
UNDERSTANDINGS OF SELF AS MATHEMATICS TEACHER AND TEACHING  
IN CONTEXT

by

Jill Marie Neumayer DePiper

Dissertation submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
2012

Advisory Committee:

Assistant Professor Ann Edwards, Chair  
Professor Patricia Alexander  
Associate Professor Patricia Campbell  
Assistant Professor Lawrence Clarke  
Assistant Professor Janet Coffey

© Copyright by  
Jill Marie Neumayer DePiper  
2012

## Acknowledgements

I would like to thank many people for their continued support and encouragement throughout this process of completing my dissertation. This journey was not one that I completed alone.

My experience at the University of Maryland College Park, particularly in the Center for Mathematics Education has been wonderful, and I would like to thank the faculty and other classmates for this invaluable experience. Specifically, I owe a great debt of gratitude to the chair of my committee, Dr. Ann Edwards. In addition to her assistance and guidance throughout the process of writing my dissertation, she provided mentoring and support throughout my experience as a graduate student. I am grateful for the support, expertise, and encouragement provided by each member of my committee. The conversations with and fellowship of my graduate school classmates were also essential during this entire process, and I am thankful for the ways you helped push my thinking, which strengthened this work.

This effort would not have been completed, nor begun, if not for my family. My parents, Richard and Marilyn Neumayer, have always provided support and encouragement as well as modeled dedication and commitment. My daughter, Leah Marie, provided a wonderful source of perspective and motivation, and she shared her smiles and laughter throughout this process. Finally, I thank my husband, Geret, for his love and encouragement before, during, and after.

## Table of Contents

List of Tables .....	ix
List of Figures .....	x
Chapter 1: Introduction .....	1
Significance of the Problem .....	2
Rationale for Study .....	4
Research Questions .....	6
Overview of Theoretical Framework .....	8
Overview of Research Design and Study .....	9
Chapter 2: Review of the Literature and Theoretical Framework .....	15
Addressing and Advancing Research on Teacher Identity in Mathematics Education .....	16
Research on understanding teacher identity .....	16
Research on supporting PSTs' identity development .....	19
Advancing the research on teacher identity in mathematics teacher education .....	24
Understanding Identity: Conceptualizing Identity Through Performativity .....	25
Prevailing Discourses and PSTs' Mathematics Teacher Identities .....	30
Discourses of mathematics teacher .....	32
Institutional discourses of teacher education and in elementary schools .....	34
Discourses about learners .....	36
Discourses about mathematics and mathematics ability .....	37
Supporting PSTs in (Re)Authoring their Identities: Performativity and Deconstruction .....	41
Deconstruction and Agency .....	42
Operationalizing Deconstruction in Mathematics PST Education .....	46
Theoretical framework for the design and implementation of deconstruction in mathematics teacher education .....	46
Role of the facilitator .....	51
Reflection and facilitated opportunities for deconstruction .....	52
Conclusion .....	58
Chapter 3: Research Design and Methods .....	59
Introduction and Research Questions .....	59
Research Design .....	60
Study Context .....	62
ElTeach program coursework .....	62
My access to this program .....	64
Internship requirement .....	65
Internship sites .....	66
Portfolio presentation and Capstone course .....	67
Cohort .....	69
Participants .....	70
Design Implementation and Seminar Overview .....	71
Goals and objectives of seminar .....	72
Overview of sessions .....	73
Key Activities .....	78

<i>Algebra for All (Session 1)</i> .....	79
<i>Angela, Mrs. Carlton, and Benjamin (Session 2)</i> .....	82
<i>Teacher A and Teacher B (Session 3)</i> .....	84
<i>Mary Hurley (Session 5)</i> .....	86
<i>The Wire (Session 6)</i> .....	88
<i>Revisiting reflections on mathematics teaching and learning (After Session 7)</i> ..	91
My Role as Facilitator and Researcher .....	92
Delimitations .....	95
Data Collection .....	95
Data Analyses .....	98
Operationalizing poststructural feminism .....	98
Research questions and overview .....	100
Case study as method.....	102
Being reflexive about positioning and repositioning .....	103
Problematizing mathematics teaching .....	107
Overview of Following Chapters.....	116
Chapter 4: Candice.....	119
Analysis of Candice Across Seminar Objectives.....	120
Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations .....	122
<i>Identifying everyday racism by teachers, in schools, and across contexts (Sessions 1 and 6)</i> .....	122
<i>Enacting a principle of everyday antiracism in education (Sessions 1 and 2)</i> ...	137
<i>Summary of Objective A</i> .....	142
Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.....	143
<i>Examining institutional pressures, social contexts, and the relations between them (Sessions 1 and 2 and Vision statement)</i> .....	143
<i>Responding to problems of practice and engaging in discursive practices that move the conversation away from problems of practice (Session 2)</i> .....	151
<i>Summary of Objective B</i> .....	154
Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher .....	156
<i>Critiquing mathematics teaching and relating mathematical vocabulary and access to mathematics (Session 3)</i> .....	156
<i>Distinguishing between how teachers are positioned and how teachers engage with students (Session 3)</i> .....	161
<i>Specifying the influence of the hidden curriculum and describing teachers as repositioning themselves and their students (Session 3)</i> .....	168
<i>Summary of Objective C</i> .....	173
Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.....	174
<i>Problematizing student responsibilities and teacher expectations as related to students' contexts and access to opportunities to learn (Session 4)</i> .....	174

<i>Critiquing and problematizing grading practices in high-stakes accountability contexts (Session 4)</i> .....	180
<i>Problematizing evaluating and reporting student progress (Session 4)</i> .....	184
<i>Analyzing supporting student learning and self-concept (Portfolio presentation)</i> .....	195
<i>Summary of Objective D</i> .....	200
Discussion/Overview .....	200
Chapter 5: Brooke .....	205
Analysis of Brooke Across Seminar Objectives .....	205
Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations .....	208
<i>Identifying how accountability pressures influence teachers and describing teaching (Session 1)</i> .....	208
<i>Describing teaching and test preparation in test-driven contexts (Session 1)</i> ...	218
<i>Summary of Objective A</i> .....	221
Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers .....	222
<i>Describing teaching vocabulary terms and relations to teachers' expectations (Session 3)</i> .....	222
<i>Analyzing teachers' expectations in school contexts (Session 3)</i> .....	228
<i>Examining the teacher's role in students' expectations (Session 3)</i> .....	234
<i>Summary of Objective B</i> .....	238
Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher .....	241
<i>Examining her positioning in her classroom (Written responses after Sessions 2 and 5)</i> .....	241
<i>Describing her response to and understanding of race in her classroom (Session 6)</i> .....	243
<i>Summary of Objective C</i> .....	249
Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching .....	249
<i>Describing practices of grading student work and engaging in practices that move the conversation away from problems of practice (Session 4)</i> .....	250
<i>Explaining practices of reporting student progress (Session 4)</i> .....	253
<i>Describing evaluating and reporting practices for students labeled as special education (Session 4)</i> .....	257
<i>Detailing instructional practices and ability grouping (Written reflection on artifact of practice)</i> .....	264
<i>Describing and supporting students' positioning in the mathematics classroom (Revisiting written reflections on mathematics teaching and learning)</i> .....	266
<i>Summary of Objective D</i> .....	270
Discussion/Overview .....	270
Chapter 6: Sarah .....	274
Analysis of Sarah Across Seminar Objectives .....	274



Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations .....	276
<i>Examining teachers' expectations and the implications for students' access to opportunities to learn mathematics (Session 1)</i> .....	277
<i>Identifying contextual constraints and pressures in mathematics teaching (Vision statement and Discourse prompt)</i> .....	281
<i>Summary of Objective A</i> .....	289
Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.....	289
<i>Analyzing the mentor-PST relationship and implications of how teachers position students on students and PSTs (Vision statement and Sessions 1 and 2)</i> .....	290
<i>Repositioning herself in relation to her mentor (Session 2)</i> .....	295
<i>Examining how teachers provide access to opportunities to learn mathematics (Session 3)</i> .....	298
<i>Examining teachers' positioning of students as related to students' career opportunities (Session 3)</i> .....	300
<i>Examining pacing pressures and grouping students by ability (Session 5)</i> .....	304
<i>Summary of Objective B</i> .....	308
Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher .....	308
<i>Analyzing her positioning in context and repositioning herself as a mathematics teacher (Written reflection on sessions)</i> .....	309
<i>Critiquing discourses of mathematics and mathematics ability and the relations to mathematics teaching (Revisiting her mathematics autobiography and reflections on mathematics teaching)</i> .....	312
<i>Summary of Objective C</i> .....	316
Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.....	316
<i>Evaluating practices of assessing students and communicating progress in response to school contexts (Session 4)</i> .....	316
<i>Interrogating the multiple discourses that position teachers and teachers' options for practice (Portfolio presentation)</i> .....	322
<i>Discussion of Objective D</i> .....	327
Discussion/Overview .....	327
Chapter 7: Laura .....	332
Analysis of Laura Across Seminar Sessions.....	332
Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations .....	335
<i>Identifying goals and standards for her mathematics teaching (Session 1)</i> .....	335
<i>Examining accountability pressures and how they position teachers (Sessions 1 and 2)</i> .....	341
<i>Examining relations between teaching context and teachers' understandings of students (Session 3)</i> .....	344
<i>Summary of Objective A</i> .....	346

Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.....	346
<i>Examining and questioning grouping and labeling students by ability (Discourse prompt).....</i>	<i>347</i>
<i>Analyzing teaching equitably in her classroom and the relations to ElCert program and standards (Session 2) .....</i>	<i>354</i>
<i>Analyzing her mentor's practices and school context for practices from ElCert coursework (Session 2) .....</i>	<i>356</i>
<i>Examining and problematizing discourses of mathematics teaching about vocabulary (Session 3).....</i>	<i>359</i>
<i>Describing students' goals (Session 3) .....</i>	<i>364</i>
<i>Summary of Objective B.....</i>	<i>366</i>
Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher. ....	366
<i>Repositioning herself in relation to her mentor (Session 2) .....</i>	<i>367</i>
<i>Mapping and describing institutional pressures in context (Session 3 and Interview) .....</i>	<i>370</i>
<i>Defining listening to students as repositioning (Session 4) .....</i>	<i>373</i>
<i>Describing her relationship to test-drive school cultures (Interview).....</i>	<i>375</i>
<i>Summary of Objective C .....</i>	<i>380</i>
Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.....	381
<i>Problematizing student responsibility (Session 4) .....</i>	<i>381</i>
<i>Problematizing grading student work (Session 4) .....</i>	<i>385</i>
<i>Articulating a teaching philosophy (Portfolio presentation).....</i>	<i>392</i>
<i>Summary of Objective D .....</i>	<i>396</i>
Discussion/Overview .....	397
Chapter 8: Discussion and Implications .....	402
Understanding Themselves Differently .....	402
Examining practices of grading and evaluating student understanding.....	403
Implications of this finding.....	406
Understandings of Mathematics Teaching as Related to Teaching for Equity.....	409
Examining practices of grading and evaluating student understanding and progress .....	410
Implications of this finding.....	411
Shifting Understandings of Self as Mathematics Teacher .....	417
PSTs' shifting understandings of self during seminar sessions .....	417
Implications of this finding.....	420
Reflecting on the Theoretical Premise of Performativity .....	423
Performativity as guiding seminar objectives and design.....	424
Performativity as guiding seminar facilitation.....	428
Performativity as guiding analysis.....	433
Conclusion .....	436
Appendix A.....	439

Appendix B .....	441
Appendix C .....	449
Appendix D .....	452
Appendix E .....	455
Appendix F .....	459
Appendix G .....	460
Appendix H .....	464
Appendix I .....	466
Appendix J .....	467
Appendix K .....	468
Appendix L .....	470
Appendix M .....	477
Appendix N .....	478
References .....	481

## List of Tables

Table 1. Overview of sessions. ....	77
Table 2. Discursive practices of being reflexive about positioning and repositioning...	106
Table 3. Discursive practices of problematizing mathematics teaching.....	109
Table 4. Presentation of the case of Candice by objective and analytic sections. ....	121
Table 5. Presentation of the case of Brooke by objective and analytic sections .....	206
Table 6. Presentation of the case of Sarah by objective and analytic sections .....	275
Table 7. Presentation of the case of Laura by objective and analytic sections.....	334
Table 8. Laura's vision statement and related ElCert program standards .....	337

## List of Figures

Figure 1. Theoretical premise underlying seminar design.....	11
Figure 2. Research questions and related analytical methods and seminar objectives ...	101
Figure 3. Objectives and related analytical tools and research questions.....	101
Figure 4. Conversational routines that suggest problematizing of mathematics teaching .....	113
Figure 5. Laura's map of relations between success as defined by test scores and actors at different levels .....	371

## Chapter 1: Introduction

I think I am experiencing an identity crisis as a teacher. ...As far as me as a math teacher, I am not sure where I see myself. I want to believe that I will be using problematic tasks and encouraging my students to explore and to question. And I *hope* that I won't be skilling and drilling my students. I *hope* I won't be using mind-numbing workbooks and textbooks. I *hope* my students are learning and growing in my classroom. I *hope* I continue to see them as unique individuals, not just as test takers. I *hope* I am still reflective and responsive to my students' needs. I *hope* that I am flexible and constantly strive to improve my teaching. I *hope* I am not stuck in a rut. I *hope* I haven't succumbed to the pressures of high stakes testing. And, I *hope* that I will think of the administrators and other teachers at my school as allies, not adversaries. (Sarah, Vision statement, March 29, 2010; emphasis added)

Sarah wrote this vision statement during the last semester of an intensive elementary master's certification program after completing over two semesters of coursework toward her degree and interning for seven months in a third-grade classroom. As she discussed across her writing assignments, she remained uncertain about how to actually maintain high expectations for all students and work toward equity in mathematics by employing teaching practices such as engaging students in conceptually rich mathematics (e.g., NCTM, 2000) in this era of high-stakes testing. Sarah questioned her personal readiness to engage in instructional best practices, her understanding of those practices, and her agency in enacting those practices in school contexts. That is, similar to many

elementary preservice teachers (PSTs), Sarah essentially asked, “What can *I* do?” (Pollock et al., 2010).

I contend that how Sarah sees herself as a mathematics teacher or, more generally, PSTs’ understandings of themselves as mathematics teachers matter for how she and other PSTs engage in mathematics teaching. While elementary mathematics teacher preparation needs to include an emphasis on instructional practices (Ball & Forzani, 2009) and classroom analysis (Hiebert, Morris, Berk, & Jansen, 2007), I argue that elementary mathematics teacher education must also support PSTs’ understanding of self as a mathematics teacher. In order for PSTs to *enact* equitable teaching practices that best support all students in learning mathematics, elementary mathematics teacher education must prepare PSTs to navigate the many social, political, and institutional dynamics in today’s classrooms. I contend that successful negotiation of these dynamics requires that teachers have an understanding of themselves as mathematics teachers, including an examined vision of their goals of mathematics teaching, the social and political contexts of schooling, and the realities of their school contexts. The purpose of this study was to explore how PSTs develop understandings of themselves as mathematics teachers and teaching as situated in the complex realities of schooling and how these understandings shift through their participation in a seminar involving critical self-examination.

### **Significance of the Problem**

PSTs do not come into mathematics teacher education as blank slates; rather, they enter teacher education with experiences with students, mathematics, and the educational system at large, as well as “preconceptions or experiential context concerning what it

means to be a teacher” (Alsup, 2006, p. 128). PSTs’ existing beliefs about mathematics (e.g., Gellert, 2000), their personal, perhaps damaging, mathematical experiences (e.g. Drake, 2006), and their understandings of students (e.g., Sleeter, 2008b) influence their interpretations of curricula, reform, and best instructional practices. Prevailing political and social discourses about students, mathematics, and mathematics teaching also influence PSTs’ understandings of mathematics teaching and their interpretation of their beliefs and experiences (de Freitas, 2008; Mendick, 2005). Research on PST identity has shown that PSTs were not always aware of these discourses or how they position PSTs’ relations to mathematics teaching, and that PSTs were reluctant to see themselves as shaped by these discourses (Brown & McNamara, 2005).

PSTs must contend with the complexities and realities of current contexts, as the multiple institutions that PSTs navigate also construct particular images of teacher practices that regulate them (Britzman, 1993; Brown & McNamara, 2005). In the complexity of their teaching environments and by the ways they are positioned in those environments, PSTs highlight different struggles, tensions that Pollock et al. (2010) identified as three different iterations of the question, “What can I do?”: a) What can *I* do?, with emphasis on what is my personal readiness?; b) What can I *do*?, that is, what are the actionable steps that I can take?; and c) What *can* I do?, asking about possibilities for action and what is my agency in this complex teaching situation?

Without explicitly addressing these tensions and the personal, social and political dynamics that give rise to them, PSTs may not feel that they are authoring their own positions toward mathematics teaching and learning or recognize that they can. That is, PSTs may be naturalized into certain teaching practices without reflection (Butler, 1999).



In positioning theory (e.g., Davies & Harre, 1990; Harre & Van Langrove, 1991), participants continually construct or position themselves in interactions. Positioning theory thus conceptualizes an individuals' understanding of self or identity more generally not as a stable role but as comprised of fluid and multiple positions that are constructed in interactions with others and contexts. Therefore, PSTs need to understand, on the one hand, that how they position themselves as mathematics teachers and are positioned by others (e.g., instructors, mentor teachers, school administration, students, etc.) is shaped by social and political discourses about mathematics and teaching, and, on the other hand, that they can use this understanding to *(re)author* their positions toward mathematics teaching and learning. As Butler (1999) argues, understanding how identity is situated and negotiated—simultaneously, asserted and threatened—may open possibilities for PSTs to *(re)author* their mathematics teacher identities, including attributes and engagements that seemed foreclosed before, understanding that PSTs' self-understandings are authored by discourses and their positioning and thus their *(re)authoring* and *authoring* happen simultaneously.

### **Rationale for Study**

Understanding of self as mathematics teacher is a critically important aspect of learning to teach mathematics. Approaches that do not address PSTs' tensions around "What can I do?" or the complex situations and multiple dynamics with which PSTs will contend as novice teachers leave them unprepared for the realities of public schooling (Liston, Whitcomb, & Borko, 2009). For instance, teachers who feel that they "are ill-equipped to teach students of color, particularly those in low-income communities, often seek jobs elsewhere as soon as they can" (Sleeter, 2008b, p. 559; see also Ingersoll,

2001). The consequences of leaving teachers unprepared for the realities of schooling are damaging, not only for those teachers, but also for students, as teachers who are unprepared may be unable to provide all students opportunity to learn or to enact equitable mathematics teaching practices. Elementary mathematics has become a highly politicized gatekeeper to higher-level mathematics and science (e.g., Stinson, 2004), and elementary mathematics teacher preparation must remain a priority (National Mathematics Advisory Panel, 2008). PSTs need approaches that attend to issues of equity, self-understanding, and the social and political contexts of teaching, and this needs to happen within content-specific teacher education (Crockett & Buckley, 2009; Lowenstein, 2009; Sleeter, 1997).

Mathematics education scholarship suggests that teacher preparation needs to emphasize dispositions and knowledge that relate specifically to mathematics and mathematics teaching for understanding (e.g., Hill, Ball, & Schilling, 2008), while also supporting elementary PSTs in understanding themselves, their students, and the social, cultural, and intellectual contexts of teaching (Cochran-Smith & Lytle, 1999). I argue that teacher education should specifically support PSTs to uncover, interrogate, and analyze prevailing discourses that inhabit the social and political realities of mathematics teaching and how PSTs position themselves and are positioned in relation to them. PSTs should be given opportunities for critical analysis of teaching decisions situated in the social and political realities of mathematics teaching in their current contexts. PSTs should be supported in exercising their agency to expand their views of teaching and (re)author themselves as mathematics teachers. Developing an understanding of self as mathematics teacher, which for Sarah means examining her own relation to the

complexities in her context, may build capacity for making sense of one's relation to the realities of schooling and classroom dynamics and taking up particular mathematics teaching practices that support access to mathematics and equitable learning environments, such as teaching students through methods of inquiry and problem solving (National Council of Teachers of Mathematics [NCTM], 2000). Little is known, however, about the specific ways in which these kinds of processes can be fostered (Rodgers & Scott, 2008), particularly in PST education (Beauchamp & Thomas, 2009).

This understanding of self as mathematics teacher is related to what the research literature frames as teacher identity. The multiple ways that identity has been understood and explored in research, however, has led to a lack of common discourse about identity. Educational research has conceptualized teacher identity, for example, as common identification within a social category (e.g., Chin & Young, 2007), as professional role (e.g., Cohen, 2008), or as personal vision (Hammerness, 2003). An alternative perspective on identity, as simultaneously personal and social and in constant negotiation (e.g., Holland, Lachicotte, Skinner, & Cain, 1998; Wenger, 1998), has been used in research on teacher identity to emphasize PSTs' identifications and negotiations as they are learning to teach (e.g., Britzman, 1993; Horn, Nolen, Ward, & Campbell, 2008). The theoretical perspective of this study extends this latter perspective of identity, accepting its fluid, situated nature, but emphasizing the importance of individual's awareness of the construction of identity and active engagement in its negotiation (Butler, 1999).

### **Research Questions**

This study extends current conceptions of identity by applying Butler's (1999) perspective of gender identity more broadly to a number of identities related to

elementary mathematics PSTs. The purpose is to understand how PSTs are developing understandings of themselves as mathematics teachers and teaching through participation in a seminar designed to support critical examination of both themselves and the discourses framing their understandings. The following research questions guide this study. For PSTs participating in a seminar on critical self-reflection and mathematics teaching in context:

- How are they understanding themselves as *mathematics teachers*? How are these understandings shifting?
- How are they understanding mathematics teaching in context? How are these understandings shifting?

In this study, I made a critical distinction between PSTs' understandings of self as mathematics *teacher* and PSTs' understandings of *teaching*. I conceptualized PSTs' understandings of being a mathematics *teacher* as positioning (Davies & Harre, 1990) because how they position themselves and how they are positioned are central to their relations to their relations to mathematics teaching and learning. I conceptualized PSTs' understandings of mathematics *teaching* as how they are problematizing mathematics teaching. Problematizing teaching includes how PSTs are negotiating three specific levels of attention—attention to core principles of teaching, strategies for instruction, and actionable steps specifically for tomorrow's classroom (Pollock, 2008)—and using particular conversational routines that open up opportunities for learning about practice (Horn & Little, 2010). This study also explored the seminar itself and how it supports PSTs' critical self-examination. I present an overview of the research study later in this chapter, and I explored these research questions and analyses in more depth in Chapter 3.

## Overview of Theoretical Framework

A driving assumption of this study is that PSTs' understandings of being a mathematics teacher and their visions of appropriate and possible mathematics teaching practice are shaped by the political, social, and institutional forces that structure the mathematics teaching that they have experienced and continue to experience—in other words, the discourses that provide systems of categories, expectations, constraints, and beliefs that organize ways of thinking and acting in relation to mathematics, mathematics teaching and learning (de Freitas, 2008; St. Pierre, 2001). I contend that *mathematics teacher* is a complex construction, framed by prevailing discourses of teaching, mathematics, and students and by local discourses within their teaching contexts. Prevailing discourses about mathematics teaching and learning that influence PSTs' understandings of mathematics teacher may include: institutional discourses around curriculum and testing (e.g., Brown & McNamara, 2005); social discourses around race, class, and student abilities (e.g., de Freitas & Zolkower, 2009; Sleeter, 2008b); discourses about mathematics as skills or as practices of “making sense” (Fuson, Kalchman, & Bransford, 2005); or, discourses of teacher as “savior” (e.g., Britzman & Pitt, 1996).

Conceptions of teacher identity assume that identity is dependent on and formed within contexts, and is relational, shifting, and multiple (Rodgers & Scott, 2008). Becoming a teacher is not developing *an* identity, but is developing *identity* as a continuous process of constructing and deconstructing understandings within the complexities of social practice, beliefs, experiences, and social norms. This is consistent with Butler's (1999) description of the process of becoming a woman: “If there is something right in Beauvoir's claim that one is not born, but rather one *becomes* a

woman, it follows that *woman* itself is a term in process, a becoming.... As an ongoing discursive practice, it is open to intervention and resignification” (p. 45). Being and becoming a teacher also should be seen as open to continuous identification and reidentification. For example, Sarah engaged in this ongoing process during her internship, identifying how her mentor’s actions shaped her interactions with her students, and, thus, how she saw herself as a teacher in relation to her mentor:

I find myself yelling at my students and I'm like, “Why am I yelling at them? They just don't get long division yet!” But ... I feel my mentor, her voice, and it's like, “Is that me?” because I used to not be a yeller. Have I become *that* teacher? ...Have I turned into my mentor? (April 27, 2010)

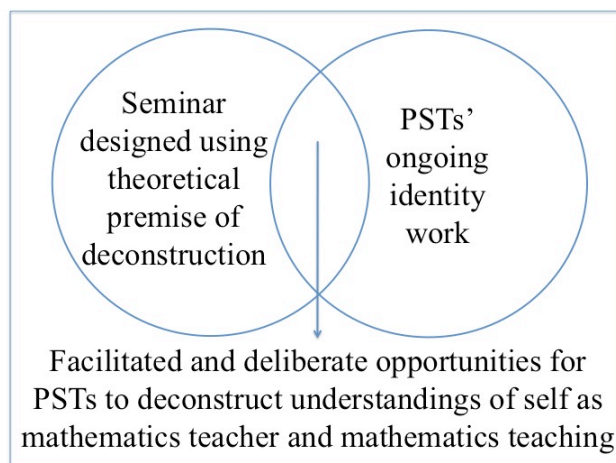
Sarah asked questions about herself and her experiences in her current context as an intern, analyzed her reactions, and wondered about the teacher that she was becoming. Sarah was doing—struggling with the internal and external forces that are shaping her understandings of herself as a mathematics teacher and of mathematics teaching—was identity work.

### **Overview of Research Design and Study**

The theoretical premise guiding the research design and the related seminar is that engaging PSTs in deconstructing these contexts, expectations, and constraints and challenging PSTs to question them and the dominant discourses that frame mathematics teaching—the “culturally established lines of coherence” (Butler, 1999, p. 33)—encourages PSTs to be actively involved in the process of identity work. Mathematics teacher education for elementary PSTs should include *deconstructing* current complexity of mathematics teaching and being a mathematics teacher. According to Butler,

deconstruction, as a process of critically examining the meaning and “substantive appearance of gender,” identifying “its constitutive acts, and locat[ing] and account[ing] for those acts within the compulsory frames set by the various forces that police the social appearance of gender” (p. 45), can support resignification. Developing awareness of these dynamics means “unpacking the invisible knapsack” (McIntosh, 2001, p. 180) of the implicit discourses that have shaped and are shaping their understandings of being mathematics teachers and making them explicit. As PSTs question these discourses and *deconstruct* (Butler, 1999) what it means to be a mathematics teacher in context, they are examining themselves as mathematics teachers. Making sense of one’s relations to the multiple dynamics in the mathematics classroom and developing understanding of self as mathematics teacher builds capacity for navigating these dynamics, attending to issues of equity, and being critically analytic about teaching decisions. Thus, this critical examination may lead to shifts in PSTs’ understandings of being a mathematics teacher and teaching as presented in Figure 1.

The seminar involved eight 2-hour sessions with one group of ten elementary PSTs in the final semester of their certification program. The goal of the seminar was to support PSTs in developing understandings of themselves and their teaching. Seminar sessions engaged the participating PSTs in *deconstruction*, a process of critical examination of their understanding of themselves as mathematics teachers, teaching, and the political and social discourses that shape their understandings. The seminar design situated critical pedagogy (e.g., Ellsworth, 1989; Freire, 1970/200; Kumashiro, 2000) in mathematics teacher education. Although PST education has included metaphors (e.g.,



*Figure 1. Theoretical premise underlying seminar design*

Fenstermacher & Soltis, 1986) and the construction of a professional identity (e.g., Peressini, Borko, Romagnano, Knuth, & Willis, 2004), I designed this seminar using theories of deconstruction and wove issues of self-understanding into mathematics content and teaching contexts. I discuss my role as designer, facilitator, and researcher; details of the study context; and, the seminar sessions in Chapter 3.

During seminar sessions, PSTs engaged in opportunities to name prevailing discourses of mathematics teaching and learning, discuss the implications of these discourses on how they position themselves and how they and others are positioned, and interrogate these discourses and positionings, thus opening up spaces for them to (re)author their understandings of being a mathematics teacher and teaching and create new positionings. The four specific objectives of the seminar are outlined in Chapter 3. PSTs analyzed case studies, transcripts, and videos, which provided opportunities for them to name and question prevailing discourses and positionings in relation to mathematics teaching and learning and to examine their own and others' practices (e.g., Cochran-Smith & Lytle, 1999). PSTs also completed writing assignments to relate these activities to their own positioning as mathematics teachers. Rather than reaching a



predetermined understanding of certain content, such as the role of race and privilege in the classroom (e.g. Howard, 2006), the goal was for PSTs to question how he or she is positioned and how others are positioned within discourses and “bring this knowledge to bear on his or her own sense of self” (Kumashiro, 2000, p. 45). That is, sessions served to open possibilities for PSTs to position themselves differently and support their self-understandings. Meeting as a group generated a sense of common cause (Kamberelis & Dimitriadis, 2008) and created spaces for PSTs to voice their concerns as well as strategize. Sessions, thus, became legitimate and valued spaces where PSTs could speak and others would listen (Cook-Sather, 2002).

I collected data from the seminar in order to examine PSTs’ understanding of themselves as mathematics teachers and teaching and how their understandings were shifting. Data include interviews, discussion transcripts, and PSTs’ written work from the seminar. I approached understanding with two different lenses.

I analyzed PSTs’ understandings of themselves as *mathematics teachers* within the related social and political discourses—that is, how they are reflexive about their positioning (Mauthner & Doucet, 2003)—using how PSTs engage in selected discursive practices of *working difference* (Ellsworth & Miller, 1996). “Working difference” (Ellsworth & Miller, 1996) is this *process* of positional knowing or the process of being reflexive about positioning and the related social and political discourses. Analytically, working difference is identifying, specifying, and responding to *positioning as contextualized, positioning as relational, positioning in performance, and repositioning*. My analysis followed how each PST engaged in the discursive practices of working difference in relation to an emergent theme. I analyzed how PSTs engaged in identifying,

specifying, and responding to positioning as *contextualized*, as *relational*, and in *performance* around this theme to explore PSTs' developing understandings of themselves as a mathematics teacher and the discourses that shape those understandings. If understandings of self are conceptualized as positioning, then repositioning and negotiating positions suggest shifting understandings of self. PSTs' repositioning served to support analysis of whether and how PSTs understandings of being a mathematics teacher shifted.

I conceptualized PSTs' understandings of mathematics *teaching* as how they were problematizing mathematics teaching. To understand how PSTs were taking up new understandings of mathematics teaching, I followed how individuals were problematizing one theme or emergent issue through the sessions, attending to content of their conversations about teaching and the practices in which they engaged in their conversations. Problematizing teaching includes how PSTs negotiated three specific levels of attention—attention to core principles of teaching, strategies for instruction, and actionable steps specifically for tomorrow's classroom (Pollock, 2008)—and used particular conversational routines that open up opportunities for learning about practice (Horn & Little, 2010). Pollock's (2008) three levels of talk served to structure the analysis of the content of the conversation, while attention the discursive practices of normalizing, specifying, revising, and generalizing (Horn & Little, 2010) were the processes of the conversation that the analysis followed.

The relations between the analyses of each PST's engagement in being reflexive about their positioning, repositioning, and problematizing teaching served to support the research questions about PSTs' understandings of self as mathematics teachers and

teaching in context and how these understandings shifted. I used the relations between the analyses *across* cases to explore how the seminar supported PSTs' critical self-examination, both their understandings of being a mathematics teacher and teaching and the shifting of those understandings.

## Chapter 2: Review of the Literature and Theoretical Framework

Mathematics teachers are engaged in teaching “not just with their [content and pedagogical] knowledge but with their whole being” (Ponte & Chapman, 2008, p. 241). Research in mathematics education suggests that teacher identity relates to why people teach (e.g., de Freitas, 2008; Gellert, 2000), how they understand the mathematics they teach (e.g., Collopy, 2003; Drake, 2006), and how they learn to teach mathematics (e.g., Horn et al., 2008). In this manner, teacher identity “stands at the core of the teaching profession. It provides a framework for teachers to construct their own ideas of how to be, how to act, and how to understand their work and their place in society” (Sachs, 2005, p. 15; see also Cohen, 2008; MacLure, 1993)

In response to the potential for relations between mathematics teacher identity and mathematics teacher practice (e.g., Peressini et al., 2004), research on teacher identity in mathematics teacher education has concentrated on *understanding* teacher identity, that is what it is composed of (e.g., Collopy, 2003; Walshaw, 2004), and also on *supporting* what the literature calls “the development of a teacher’s identity” (Ponte & Chapman, 2008, p. 246). In this discussion, I review literature in these two areas. In response to the literature, I contend that conceptualizing and understanding mathematics teacher identity in line with the Butler’s (1999) theoretical premise of *performativity* and then supporting PSTs’ identities through a process of deconstruction may advance research in mathematics teacher education and create opportunities for PSTs to (re)author their teacher identities in their teaching contexts. In this chapter, I also detail performativity, described as a process of how identities are shaped by and understood in relation to prevailing social and institutional discourses and deconstruction, as a process of

examining and troubling identities (Butler, 1999). I also present my theoretical framework on how to operationalize these theoretical premises in mathematics teacher education.

### **Addressing and Advancing Research on Teacher Identity in Mathematics Education**

**Research on understanding teacher identity.** Research on understanding teacher identity has been grounded in various perspectives in education, anthropology, and psychology and likely influenced by Erikson's (1959) seminal work on identity development and by researchers within social psychology (e.g. Stryker, 1968; Tajfel, 1982). Identity has been understood as an individual's role that they take in situations (e.g. Stets & Burke, 2000) and related to teacher actions in line with these roles (e.g., Ronfelt and Grossman, 2008). A focus on role, however, does not attend to the dynamic nature of identity or the ways in which individuals negotiate their identity in context (Britzman, 1993).

Research on teacher identity has also theorized identity as individualistic, defined as “the constellation of interconnected beliefs and knowledge about subject matter, teaching and learning as well as personal self-efficacy and orientation toward work and change” (Collopy, 2003, p. 289). Case studies that seek to understand teacher identity as beliefs have demonstrated how different teachers interacted with or embraced mathematics reform curricular materials and suggest that beliefs need to be considered when understanding how teachers engage with opportunities to learn (Collopy, 2003). Other research, collected through teacher interviews, highlighted how teachers' personal stories of mathematical experiences influence their interpretations of reform (Drake, 2006) and their conceptualizations of mathematics (Gellert, 2000) and how curricula and

reform are filtered through teachers' existing beliefs and schema (Wilson and Goldberg, 1998). Research that sees identity as personal or individual may not incorporate society's influence on identity construction or attend to the social norms about mathematics or teaching that influence or construct teachers' experiences, beliefs, or identities.

In addition to limitations of particular perspectives, the multiple ways that identity has been conceptualized and explored has led to a lack of common discourse about identity. In a review of research on teacher professional identity, Beijaard, Meijer, and Verloop (2004) noted that in the reviewed studies, identity was defined differently or not defined at all. They also argue for more conceptual clarity in research on identity, and in particular they suggest that future research needs to seek to understand the role of context and analyze teacher identity through a perspective that embraces a more sociological perspective (Beijaard et al., 2004). Research on teacher vision (e.g., Hammerness, 2003) or research that frames identity as personal and individual (Collopy, 2003) does not articulate social and political influences on teacher identities or the ways in which prevailing perspectives of mathematics or teaching may influence PSTs' identities. That is, conceptualizing identity as individualistic may not be productive for addressing PSTs' identities in the complexity of their school contexts.

Some research in mathematics education has addressed this concern using both situative frameworks and poststructuralist views of identity. For example, Peressini et al. (2004) proposed a framework to help understand and explain the ways in which contexts of teacher education and early career teaching influenced the identity development of secondary mathematics teachers. Research also suggests the importance of a poststructuralist view of identity where elementary mathematics teacher identity is

transitory and influenced by systems of power (e.g., Brown & McNamara, 2001; Walshaw, 2004, 2010). Walshaw (2004) emphasized the ways in which PSTs' identities are related to both their coursework and internship experiences, that is, the "formal and informal educational discourse and practice" (p. 70) and are continuously shifting:

Pre-service teachers are not only redefining their teaching identities in relation to the available discourse in the classroom and to the complex selves of others, they are also learning what is defined as "normal" practice through the school's organizational procedures. Arguably, institutional practices are measures and techniques that produce identities implicitly rather than by repressive force, yet the rationalities underpinning their specific ways of doing and knowing have the same purpose of securing the conforming individual. The school, construed as a regime of power, constructs specific regulatory practices for the normalization of and ultimately the production of the self-governing individual teacher. (p. 72)

This perspective of identity emphasizes the role of power and knowledge in shaping identities and in PSTs' understandings of the availability of certain discourses. Llewellyn (2009) also conceptualized identity as situated and in process, reporting on the prevalence of gendered discourses about mathematics in PSTs' understandings of teaching.

Specifically, she suggested that PSTs responded to mathematics as gendered, noting a masculine mathematics teacher and a feminine primary school teacher, and she emphasized the potential implications on teacher practice (although she did not empirically examine the influence of those discourses on identities or enactments).

Although conceptualized differently than the research by Collopy (2003) or Drake

(2006), these studies also proposed identity as a framework for understanding teachers' reactions and engagements (e.g., Cohen, 2008; MacLure, 1993).

**Research on supporting PSTs' identity development.** Research by Horn et al. (2008) seemingly bridged these two areas of research, seeking to understand PST identity and specifically articulating how to support it. Horn et al. used perspectives of identity as conceptualized in anthropology (Holland, Lachicotte, Skinner, & Cain, 1998), where individuals in context are constantly engaged in creating their identities and self-understandings that may guide subsequent behaviors: "Identities are improvised—in the flow of activity within specific social situations—from the cultural resources at hand" (Holland et al., 1998, p. 4). Horn et al. frame identity development and learning "as arising out of the interns' interactions with *figured worlds*—the socially-constructed roles, meaning systems, and symbols of the cultural contexts they encountered" (p. 62). Within two different arenas, their teacher education courses and their fieldwork sites, the PSTs' identities shaped and were shaped by their experiences and their identities "oriented them differently to the teaching practices promoted in their formal coursework" (p. 64). PSTs who made the most advancement towards stated course goals also seem to have experienced a certain tension between their field experience and their formal coursework, and this tension may have influenced their negotiation of identity. Teacher identity, as shaped by teacher learning and engagement in the two arenas, may inform discussion on PSTs' engagement in certain practices within teacher education courses. Specifically, PSTs' processes of identification and negotiation of their figured worlds "provide a way for teacher educators to conceptualize engaging interns' teacher identities



to create openings for new learning” (p. 70- 71). In this manner, this research provides insight into understanding and supporting PSTs’ identities.

Research on supporting PST identity, however, is traditionally tied to ideas of “transformation,” “construction,” or “identity development,” as suggested in reviews of research on teacher identity (Rodgers & Scott, 2008) and in reviews of mathematics teacher identity specifically (Ponte & Chapman, 2008). There is an emphasis on forming or constructing a professional identity, and as Rodgers and Scott (2008) suggested, “a hidden developmental expectation or assumption held by teacher educators and teacher education programs that teachers should, in fact, make sense of their experiences at a particular *level* of development” (p. 751; emphasis added). That is, there is a focus on identity *construction*, where teacher professional identity is formed and created in teacher education or an emphasis on “developing an identity as a teacher,” (Hammerness, Darling-Hammond, & Bransford, 2005), where there is an underlying idea of adding elements to *an* identity or taking up a new identity. Understanding identity in a manner consistent with Walshaw (2004) or Llewelyn (2009), however, conceives of identity as an ongoing process, not limited to either a teacher education program or the messages that teacher education would like to send, and related to PSTs’ contexts, experiences, and the understandings they have made of those experiences.

Conceptualizing identity as a process is not discussed as readily in teacher education research, and it is seemingly important. A study by Ensor (2001) suggests how understanding identity as a process may have implications for supporting PSTs’ identity work. Ensor (2001) found that as the PSTs became novice teachers, the identity development work that was done in teacher education work was “recontextualized” (p.

312) or revised in teacher practice as the novice teacher repurposed their teacher education coursework and used ideas such as “discovery learning” and “visualization” (p. 302) in a manner not consistent with their coursework. This leads to questions about what identity work should look like, what reflection should look like, or how PSTs understood themselves as mathematics teachers.

PSTs in the Ensor (2001) study completed “reflective journals” (p. 302); this reflection was not detailed and it may not have been systematic. Rodgers (2002), for example, questioned how reflection is implemented in teacher education, asking a question that is related to Ensor (2001): “Does mere participation in a study group, or the keeping of a journal, for example, qualify as reflection?” (Rodgers, 2002, p. 843). Furthermore, the ideas, such as discovery learning, may already be burdened with social and personal discourses that are difficult to subvert. For example, “how does an expression such as ‘mathematical investigation’ get introduced into the vocabulary of a [PST] who has never experienced one?” (Brown & McNamara, 2005, p. 97). In this manner, supporting PSTs in identity *development* in teacher education without attending to how identities are constructed in space, time, experiences, and understandings may not support the ways in which PSTs are able to enact identities in context. Britzman (2003) emphasized how PSTs’ identities shift not only because of their engagements and commitments as first year teachers but also because of the way their context matters:

The construction of the real, the necessary, and the imaginary are constantly shifting as student teachers set about to accentuate the identities of their teaching selves in contexts that are already overpopulated with the identities and discursive practices of others. ... Within such contexts, where desires are assigned and

fashioned, student teachers strive to make sense and act as agents in the world.

Indeed much of their time is taken up with negotiating, constructing, and consenting to their identity as a teacher. (p. 221)

PSTs are constantly negotiating their identity, and teacher education coursework that emphasizes *constructing* a professional identity (e.g., Katz et al., 2011) may not support PSTs in negotiating their identities in practice

There are two particular studies in mathematics teacher education that emphasize alternative perspectives of identity and how to support them. For example, Stinson and Powell (2009) reported on a mathematics education course that was guided by postmodernism. The course objectives were for students to develop an initial understanding of the philosophical underpinnings of postmodern theory and examine mathematics, mathematics teaching and learning, and research in mathematics education from a postmodern lens. The purpose of the seminar was to provide students with opportunities to reflect differently on themselves and their practices, in particular, “to take the familiar discursive binaries of mathematics education and to undergo a deconstructive process, individually and collectively” (p. 322). Stinson and Powell found that this process allowed mathematics teachers to think differently about their mathematics teaching and served as a tool for supporting mathematics teachers to interrogate both traditional mathematics teaching and the discourses that defined their mathematics teacher identities. This graduate course and related study, however, was not directly tied to particular instructional practices or preservice teacher education coursework. De Freitas and Zolkower (2009) developed and implemented explicit strategies for engaging secondary mathematics PSTs in discussion about discourses and

social semiotics to support teaching for social justice. Although their study is not about identity specifically, they found that the PSTs were able to note the complex relationship between language use and its subjectivity because of these activities, and they suggest that tasks such as these are crucial to PSTs' understandings of teaching mathematics, particularly in enhancing their teaching for equity. It is important to consider the ways in which the research by Stinson and Powell (2009) or de Freitas and Zolkower (2009) could be completed in *elementary* mathematics teacher education.

Research suggests that teacher education settings may be successful for supporting PSTs' identity work and specifically their reflections on themselves and their practice as mathematics teachers (Ponte & Chapman, 2008). A review of the research on teacher identity suggested that there is an emphasis on the ways in which teacher education programs can support PSTs and their identities in context: "A teacher education program seems to be the ideal starting point for instilling not only the awareness of the need to develop an identity, but also a strong sense of the shifts that will occur in that identity" (Beauchamp & Thomas, 2009, p. 186).

Research, however, does not illuminate *how* identity develops and how teacher education can foster this (noting the studies by Stinson and Powell (2009, 2010) and de Freitas and Zolkower (2009) as potential exceptions). In a review of mathematics education research on teacher identity, Ponte and Chapman (2008) asserted that teacher identity is seen as "by-product of teacher education programs rather than as a targeted outcome" (p. 246), and therefore, more focused research on teacher identity is needed. Furthermore, Rodgers and Scott (2008) found that most research on teacher identity development in teacher education programs was "theoretical in nature, and either

speculated about practices that might support teachers' identity formation, contained first person teacher reports on identity transformations, or exhorted teacher education and professional development programs to address teacher identity. Empirical studies were scarce" (p. 747). That is, little is known about how to foster teacher identity (Rodgers & Scott, 2008) or teacher identity work, particularly in PST education (Beauchamp & Thomas, 2009). Thomas and Beauchamp (2011) concluded a recent study on work with metaphors in PST education and emphasized the need for more research:

We have come to the realization that the development of a professional identity does not automatically come with experience, and that some form of deliberate action is necessary to ensure that new teachers begin their careers with the appropriate tools to negotiate the rocky waters of the first few years. The findings of this study suggest that more attention needs to be paid to raising awareness of the process of identity development during teacher education programs, although further research is needed to determine what form that might take. (p. 767)

In this manner, further empirical research that identifies processes that support PST identity work in preservice teacher education are needed.

**Advancing the research on teacher identity in mathematics teacher education.** In response to this literature, I contend that teacher identity needs to be conceptualized in a manner that accepts and supports its complexity and how identity is constant negotiation in context. This dissertation research conceptualizes identity in a manner that offers mathematics teacher education and PSTs a tool to engage in identity work. Performativity (Butler, 1999) offers both a theoretical premise to understand identity and a framework for how to foster it, a process of deconstruction, thereby *using*

theories of identity in course design and in supporting PSTs in understanding themselves. In this next section, I outline performativity and the ways in which it may explain PSTs' identities.

### **Understanding Identity: Conceptualizing Identity Through Performativity**

I conceptualize identities as ways of seeing and understanding oneself and one's positionality that are constructed within discourses. Specifically, PSTs' understandings of being a mathematics teacher and their visions of appropriate and possible mathematics teaching practice are shaped by the political, social, and institutional forces that structure the mathematics teaching that they have experienced and continue to experience—in other words, the *discourses* that provide systems of categories, terms and beliefs that organize ways of thinking and acting in relation to mathematics, mathematics teaching and learning (Davies, 2000; St. Pierre, 2001). Gee (1996) also defined a view of discourse that includes more than just linguistics but also the socially situated nature of discourse. Discourse, however, for Gee (1996) is personal, and he emphasized how discourse is a tool that an individual can use to “identify oneself as a member of a socially meaningful group or ‘social network’ or to signal (that one is playing) a socially meaningful role” (p. 131). This is different from how discourse is used here, where discourses are political, historical, and social forces that are outside an individual:

Discourses are not static, personal mental frames, but rather public agreed upon ways of doing things whose meanings may change over time. They imply forms of social organization and social practices that both structure institutions and constitute individuals as thinking, feeling, and acting subjects (Walshaw, 2001, p. 481).

Foucault (1980) is credited with this conceptualization of discourses. Foucault's notions of discourse emphasizes how knowledge, truth, and subjects are produced in language and cultural practice and how discourse works in very material ways through social institutions and socially-regulated rules to construct realities that position individuals and control their actions.

The Foucauldian conceptualization of discourse also frames poststructural feminist views of discourse. Feminists use this perspective to analyze the construction of discursive formations of patriarchy, for example, and the assumptions behind them, and subsequently to contest these discourses (St. Pierre, 2001). The objective is both to understand how discourses create a structure and how they can be subverted. Some suggest that this view may diverge from the Foucauldian conceptualizations of discourse, where Foucault "leans more heavily on the side of determinism than [his] protestations against determinism" (Erickson, 2004, p. 136). St. Pierre (2001), however, suggested, "Foucault's theory illustrates that shifts in historical thought do occur when people think of different things to say, and therefore, resistance to discourses of domination is possible" (p. 486). That is, St. Pierre, Butler (1999), and other poststructural feminists assert that discourses can be contested. Consistent with these researchers, this dissertation research defines discourses as historical, social, and political structures and forces that act on individuals and can be challenged, and identities are ways of seeing and understanding oneself and one's positionality that are constructed within discourses.

Consistent with the above framing of discourses, the conceptualization of identity in this research reflects how *identities* are simultaneously personal and social, thriving within the complexities of social practice, personal beliefs and experiences, and the

constraints of social constructions and social norms. This view of identity embraces ongoing tensions and presents identities as performed in action and context, constantly created and recreated. Identity, in this perspective, involves negotiation of both membership to different social categories and individual choices or unique experiences within power relations and discursive practices that are already present in the situation, such as a classroom (Walshaw, 2004). Because the taking up of an identity is in constant social negotiation, it is not synonymous with role or function (Britzman, 1993). Moving away from identity as operationalized through the idea of “role,” the concept of “positioning ...focus[es] attention on the dynamic aspects of encounters in contrast to the way in which the use of ‘role’ serves to highlight static, formal and ritualistic aspects” (Davies & Harre, 1990, p. 43). Through focusing on the discursive practices and how they constitute the speakers, this perspective can embrace, if not explain, discontinuities in productions of self in conversations with others: “An individual emerges through the processes of social interaction, not as a relatively fixed end product but as one who is constituted and reconstituted through the various discursive practices in which they participated” (Davies & Harre, 1990, p. 45). In this research, identity is discussed in the plural, as within this perspective, the word *identities* may be more appropriate for capturing how identity is dynamic, situated, and is not defined by a singular coherence.

Butler (1999) used the theoretical premise of *performativity* to connect identities and discourses and to explain how identities are shaped by contextual and historical elements and discourses. Although the views of identity as suggested by Holland et al. (1998) and Wenger (1998) and their ideas, such as multimembership and ongoing negotiation of tensions, may be consonant with Butler (1993, 1999) and the theoretical



premise of performativity, Butler has a different focus, if not agenda. Butler may agree that identity involves both participation and reification, but her goal is to question the categories and community boundaries themselves and encourage the negotiation and complexity that Wenger highlights. In this perspective of identity, performativity presents the fluid elements of identity and is interested not only in their construction but their deconstruction. As a theoretical research tool, embracing a perspective of performativity means not categorizing or focusing on solely individual elements of identity, but investigating how these identities are shaped, highlighting their contextual and historical elements, and deconstructing and reconstructing identities.

To theorize about how gender identity is constituted, performativity first suggests that gender identity is shaped by discourses and is thus a process of being naturalized into engaging in imitative practices (Butler, 1999). As the process of identity construction is a process that is regulated and constructed within discourse, and thus is a constrained choice, *performativity* is a continuous process of being naturalized by these outside forces, where the body is not a subject or actor but an occasion or place of this process. Thus, what individuals take as internal essence of identity is created through repeated engagement in a series of acts that are governed by discourses outside of individuals themselves. Performativity is the “power of discourse to enact what it names” (p. 187), and identities are under constant influence, not present from the beginning, but instituted in specific contexts. For example, a PST’s teacher identity involves negotiation of discourses and experiences within power relations and discursive practices that are already present in the situation as well as PSTs’ previous experiences (Walshaw, 2004).

Performativity is used to highlight prevailing discourses and subsequent process of *construction* of identities to open opportunities for individuals to engage in *deconstruction* of these identities and in other constructions or “becomings” (Butler, 1999, p. 45). Butler’s specific goal is to release gender identity from restricted constructions, and performativity is presented in,

an effort to think through the possibility of subverting and displacing those naturalized and reified notions of gender that support masculine hegemony and heterosexist power, to make gender trouble, not through the strategies that figure a utopian beyond, but through the mobilization, subversive confusion, and proliferation of precisely those constitutive categories that seek to keep gender in its place by posturing as the foundational illusions of identity. (p. 46)

Disrupting the restricted, reified discourses of gender and gender identity is necessary because of the uneven power dynamics these discourses support and how these discourses minoritize certain expressions (Butler, 1999). The objective is to “open up the field of possibilities for gender without dictating which kinds of possibilities ought to be realized” (p. viii). Butler proposes to disrupt the restricted identities through breaking down the categories and discourses that are subsumed within gender and that foster its illusional coherence and preferred position as two binary categories. Using performativity within mathematics teacher education suggests exposing the prevailing or restricted discourses that shape some teacher identities and troubling these discourses in order to support PSTs in understanding themselves as mathematics teachers and (re)authoring their mathematics teacher identities.

Butler (1999) is specifically addressing gender identity and issues of sex and gender, while this research overlaid this premise on mathematics teacher identities. This is not meant to present gender identity and mathematics teacher identities as either qualitatively similar or involving the same struggles and challenges. The application of performativity to mathematics teacher identities may afford a way to think about PSTs' identities as emergent and influenced by social and historical forces and support PSTs' own thinking about their identities; however, the performativity and subsequent deconstruction of gender identities likely involves subversive acts that may have more social and personal consequences as compared to the performativity and subsequent deconstruction of mathematics teacher identities. While much of the theoretical premise of performativity of identities, including the importance of viewing identities as contextual, emergent, and in process and the distinction between performance and performativity of identities, supports thinking about PSTs' mathematics teacher identities, this research will also seek to understand the limits of this premise in its application to PSTs' understandings of themselves as mathematics teachers and of mathematics teaching.

### **Prevailing Discourses and PSTs' Mathematics Teacher Identities**

Performativity suggests the power of discourses to shape identities, and there are many dominant social, historical, and political discourses that potentially influence PSTs' mathematics teacher identities. Individuals' struggles are local and specific, rather than totalizing, and relations of power are complex and shifting (St. Pierre, 2000).

Specifically, for a teacher,

constituted by her relationship, among others, with her students, their parents, her school, and the wider community, discourses provide taken-for-granted ideas and ways of practice that come before any views she might have about herself as a teacher. Her access to subjectivity is not completely open but is governed by historically specific social factors and forms of social power. Thus discourses are powerful in the sense that they function as sets of rules constraining and enabling what the teacher might say, write about, think of, or imagine at a given moment. (Walshaw, 1999, p. 100)

PSTs will have different relationships to these discourses, such as the ways in which some discourses influence some PSTs more than others (e.g., MacLure, 1993). Teacher education should consider the many different discourses and understandings of power that may relate to PSTs' experiences and identities in order to provide PSTs with more "room to maneuver" (St. Pierre, 2000, p. 493) and more possibilities for subversion.

Prevailing discourses of student abilities, mathematics, and teaching, for example, may create a rigid frame of mathematics teacher identity that confines PSTs and "forecloses in advance the emergence of new identity concepts" (Butler, 1999, p. 21). Theoretically, mathematics teacher identity may be reified in ways that may not attend to its complexity, and it may be difficult for PSTs to take up new identities. For example, if discourses of teacher as one who creates a safe or "fun" place for doing mathematics (e.g., Gellert, 2000) or of mathematics as a set of skills (as reported by Fuson et al., 2005) shape a PSTs' mathematics teacher identity, embracing a view of teacher as someone who challenges students and incorporates students' solutions into problem solving may be difficult because that is not how mathematics teacher identity has been framed. A

restricted meaning of an identity also idealizes certain expressions of that identity, which ignores how claims of universality fall apart:

If one “is” a woman, that is surely not all one is; the term fails to be exhaustive, not because a pregendered “person” transcends the specific paraphernalia of its gender, but because gender is not always constituted coherently or consistently in different historical contexts, and because gender intersects with racial, class, ethnic, sexual and regional modalities of discursively constituted identities.

(Butler, 1999, p. 4)

Totalizing claims of “woman,” “man,” or other fixed categories are “reverse-discourse that uncritically mimics the strategy of the oppressor instead of offering a different set of norms” (p. 18). Universalistic claims oppress the development or changes in the subject, and fixed gender categories minorities certain people and groups without opening up possibilities for acceptance of all individuals (Butler, 1999).

In the following sections, I outline potential discourses that influences PSTs’ understandings of themselves as mathematics teachers. Highlighting the potential prevailing discourses is not intended to suggest that PSTs are learners who have deficient knowledge or that they are incapable of subverting these discourses. Rather the following presentation seeks to emphasize the multitude of discourses that may shape and influence PSTs’ mathematics teacher identities and that which PSTs may negotiate.

**Discourses of mathematics teacher.** Preservice elementary mathematics teachers’ identities are likely first constructed within the discourses of mathematics teacher they encountered as elementary and secondary students. After many hours watching teachers when they were students in Grades K-12, PSTs may be apprenticed

into teaching and have accepted a discourse of what a teacher is without full understanding or acquiring knowledge of the profession (Lortie, 1975). A PST's experience as a student in a K-12 classroom "is not likely to instill a sense of the problematic of teaching—that students, because of the limits of their vantage point and empathic capacity, will see it simplistically" (Lortie, 1975, 65). In response to their own experiences or media, PSTs may also understand a teacher as a savior or embrace a "rescue fantasy," where a teacher has the power to rescue a student from difficulties and ensure his or her success (e.g., Britzman & Pitt, 1996; Robertson, 1997).

Experiences as a student of mathematics in particular may also shape a PST's view of mathematics teacher. PSTs' personal mathematical experiences as students are set within discourses about what teaching is and what mathematics is and subsequently these discourses influence their interpretations of reform (Drake, 2006) and their conceptualizations of mathematics (Gellert, 2000). Specifically, as negative experiences as students led PSTs to want to teach mathematics in a "nice and amusing way" (Gellert, 2000, p. 258), this may be part of a dominant discourse about how mathematics is not a subject that should be understood and thus should be taught to students in a manner that minimizes both challenge and frustration. PSTs may also need to "reconcile a reform-based image of school instruction with their personal prior beliefs about the subject matter" and with their beliefs about learning and teaching resultant from experiences as students in schools (Luehmann, 2007, p. 823; see also Brown & McNamara, 2005). Past experiences with teachers and mathematics specifically further support a social construction of a teacher or teaching (e.g., Walshaw, 2001), and these prevailing discourses of teacher may influence a PSTs' understandings of mathematics teacher.

### **Institutional discourses of teacher education and in elementary schools.**

PSTs' coursework and fieldwork also express particular discourses of teaching and learning. Current mathematics (and science) teaching reforms and teacher education coursework encourage reform teaching practices and ask teachers to engage in practices, such as a focus on inquiry or student-to-student discussions about mathematics, that they did not engage in as students (i.e., Luehmann, 2007). Schools, however, may not devote time to critical thinking or developing skills and habits of life-long learners, practices that some reforms and teacher education programs emphasize (Selwyn, 2007). That is, reformed mathematics teaching practices encouraged in university mathematics methods courses may not be available in the elementary mathematics classrooms that PSTs experience during their fieldwork: "Student teachers reported relatively few encounters with desired selves in the field, especially ones that reflected the images promoted in their coursework. This imbalance represents an ongoing challenge for teacher education that is focused on preparing teachers as change agents" (Ronfeldt & Grossman, 2008, p. 49). If PSTs do not encounter practices, "desired selves" (or their visions), or particular discourses about mathematics teaching and learning, these alternative discourses are not available to them: "If the aim of teacher education is a reformed practice that is not readily available, and if there is no reinforcing culture [in the elementary mathematics classrooms or school] to support such practice, then the basic imagery of apprenticeship breaks down" (Sykes & Horn, 1992, as cited in Putnam & Borko, 2000, p. 8). PSTs exist under certain constraints and expectations (e.g., Britzman, 2003; Llewellyn, 2009), and in their fieldwork, their understandings of mathematics teachers may be stabilized, not destabilized, because of the dominant institutional discourses present and the ways in

which perspectives of mathematics teaching as presented in the university mathematics methods courses are not present in a classroom. PSTs need opportunities to trouble the discourses of both traditional mathematics teaching and reform efforts (e.g. Stinson & Powell, 2010).

As they navigate the many demands of schools, curriculum and regulative policies, beginning teachers may become alarmed by the absence of their “own voice” (Brown & McNamara, 2005, p. 3). Some PSTs recognized this tension and the ways in which their understandings of teacher were shaped by institutional and societal pressures: “[Karen’s] personal aspirations of what it is to be a teacher have become subsumed or conditioned by the language she feels compelled to speak in order to become accredited and then employed within a school. But then again, if it were possible to find the real Karen, who would this be?” (Brown & McNamara, 2005, p. 3).

Schools themselves may market themselves as “traditional” or “progressive,” but these designations are rarely clear, are not necessarily embraced by the teachers or by the institution, and may bear “no true correspondence to the complexity and eclecticism of the individual school’s or teacher’s actual philosophy, policy and practice” (Moore et al, 2002, p. 561). Rather than bring clarity, some PSTs experience more confusion about the institutional discourse within the school (Moore et al., 2002). Some school districts are quite clear about their “single-minded mission to raise test scores” (Selwyn, 2007, p. 132), which PSTs see as is in direct conflict to their teacher education programs that emphasize the importance of a student-centered approach and culturally-responsive teaching. Policies, such as No Child Left Behind, have redefined accountability and reduced learning to scores, realities that have transformed schools (Apple, 2007). PSTs



are immersed in the discourse that “equates teaching quality and students’ learning with high-stakes test scores” (Cochran-Smith, 2005, p. 101). These different discourses about teaching and learning from teacher education and institutions influence PST identities, as PSTs’ identities further become shaped “through the reification of norms” (Butler, 1993, p. 10), the lack of alternative discourses about teaching or new practices, or the conflict between different institutional discourses.

**Discourses about learners.** Political, social, and historical discourses about learners also have potential to shape PSTs mathematics teacher identities. In a review, Sleeter (2008b) found that White PSTs commonly bring deficit-oriented stereotypes about learners from diverse backgrounds and have little cross-cultural knowledge or experience. PSTs’ identities may be shaped by this discourse of a deficit perspective of learners from diverse backgrounds. Whether this discourse leads PSTs to embrace “naïve optimism” about their abilities to teach (Sleeter, 2008b, p. 559), to imagine “rescuing students” (Robertson, 1997), or to make assumptions about students’ lack of abilities because of these differences, there is a dominant discourse about students from different backgrounds and their abilities that PSTs may encounter. There is also a dominant discourse about a “glorious era” known as “Public School Way Back When (PSWBW)” (Ladson-Billings, 1999, p. 219). In PSWBW, children were “so smart and well behaved” and “we didn’t have to worry about discipline” (p. 219). While Ladson-Billings (1999) is referencing a time before school desegregation and how teacher education in the 1960s responded by creating separate workshops or courses in multicultural education, this prevailing discourse about learners or schools themselves as being different from what PSTs experienced continues.

In a backlash against a deficit perspective of students, PSTs in teacher education programs may feel that there is a dominant discourse about the strengths of diversity; this discourse may not attend to student struggles or the difficulties in operationalize equitable practices. Lubienski (2003) suggested that in moving away from a discourse about deficit views of students, research and teacher education can not only restrict our conversations to positive aspects of diversity: “Restricting our conversations to only positive aspects of diversity is an academic, middle class luxury that detracts from research on and attention to social class and larger systemic inequities” (p. 36). Conversations about diversity need to balance discussions about strengths of all students, including students from diverse backgrounds, while also “acknowledging the struggles involved with educating diverse students without validating those who hold low expectations for poor and minority students and who believe that full responsibility for achievement gaps rests with ‘deficient’ parents” (p. 36). Both of these competing discourses may shape PSTs identities, and they may have difficulties articulating their acknowledgement and support of student difficulties and differences while avoiding a deficit perspective.

**Discourses about mathematics and mathematics ability.** Mathematics itself also is also constrained by discourses, presented as “cold, absolute, and inhuman” (Ernest, 2004, p. 16). Teachers, other learners, and the experience of learning itself may conform to this view (Ernest, 2004). Mathematics, when considered as limited to following rules and memorizing, is not considered as making sense; “sense-making is irrelevant” to mathematics (Fuson et al., 2005, p. 217). Students aligned with this discourse, describing mathematics as “certain,” “defined,” “strict,” and more rigid than other subjects and not as a process of making sense (Mendick, 2005). One high-school

student, planning to double major in physics and mathematics in college, compared his view of mathematics to English class:

When in English, as a [school] subject, it's not like that at all. It's really working with things, there's rules, but there aren't really any proper, none of them are rigid ... They always say the best artists are, they learn rules and break them, and that's true. There aren't so many rules in English. And they aren't rigid. (Mendick, 2005, p. 206)

Similarly, PSTs saw rules, procedures, and right answers as defining of mathematics (Llewellyn, 2009). This prevailing view of mathematics may lead a teacher to enact teaching practices that restrict student engagement or authoritarian (Llewellyn, 2009). This view of mathematics also does not recognize mathematics as a cultural practice and may lead to a teacher who has difficulty in identifying the political implications of mathematics teaching (de Freitas, 2008).

A discourse of mathematics as gendered may also set up mathematics identity as a choice for women: "This, at its simplest, means that women must choose to be feminine or choose to be successful at mathematics. If they opt for both, they have to live with the contradiction  $\text{Mathematics} \neq \text{Feminine}$ " (Ernest, 2004, p. 18). In the mathematics classroom, these discourses may materialize as the masculine mathematician and feminine primary school teacher, where the female primary school teacher does not engage in the mathematics (Llewellyn, 2009). Inscribing mathematics as masculine made it "more difficult for girls and women to feel talented at and comfortable with mathematics and so to choose it and to do well at it" (Mendick, 2005, p. 217). The current discourse about mathematics as gendered or restrictive to certain people may

prompt PSTs to take up a “strong position of a non-mathematics person,” and, “as a consequence, an unhelpful opposition [to mathematics] is created” (Llewellyn, 2009, p. 419). The view of mathematics, not only as gendered, but also as exclusive of women, has many destructive educational and pedagogical consequences, from teacher beliefs to curriculum to testing systems (Ernest, 2004).

Definitions of school mathematics and their enactment in classrooms “constitute the meaning of mathematical reality for the female learner” (Walshaw, 2001, p. 475). Students’, especially girls’, reactions to mathematics as adults may be because of how they were positioned as children (Walkerdine, 1989; 1990). Walkerdine (1990) notes that “while the identity created by the school may well be a fiction, it has powerful effects” (p. 54) and may position girls as unsuccessful in mathematics. Prevailing discourses of girls as low performers in mathematics and teachers’, schools’ and even parents’ positionings of girls in mathematics subsequently influence their performance and sometimes a perspective of mathematics as a subject in which they can not succeed (Walkerdine, 1989; 1990). Gendered discourses in mathematics that decide who speaks and whose thoughts are valued (Mendick, 2005; Walkerdine, 1990) may also influence PSTs’ identities as mathematics students and teachers.

Racial discourses about who can succeed in mathematics also position students (Martin, 2007) and may influence PSTs’ identities. African-American students and parents stated that their status as African-American and “the treatment that they have received as a result of this status have hindered their ability to become meaningful participants in mathematics” (p. 149). Martin (2007) suggests a masternarrative that involves “interpretations of underachievement and limited persistence” may deny African

Americans agency, voice, and opportunity in mathematics: “In the case of African Americans and mathematics, they are presented as inferior to Whites and Asian Americans; failure is constructed as normative; and their struggle to obtain mathematics literacy, despite barriers and obstacles receives little attention” (p. 149). This and other racialized discourses about mathematics achievement may shape how PSTs understand their students, their own mathematics abilities, and specifically their mathematics teacher identities.

Restrictive discourses of mathematics, such as who can and should do mathematics, potentially constrain elementary mathematics PSTs’ identities about mathematics teaching and learning. Research suggests that teachers are influenced by the ways students are labeled and understood by other teachers and administrators in their environment and also by the way mathematics achievement is understood as related to speed and motivation (e.g., Horn, 2007). Teachers’ conceptions of students are also reinforced through school’s curriculum pacing and ability grouping systems (Horn, 2007; Watanabe, 2008). Teachers’ and PSTs’ understandings of students are shaped by their understandings of diversity and equity, mathematics ability, and the ways in which their school environments and the social and political contexts of schooling perpetuate these views. That is, in this era of high-stakes mathematics testing, interrogating these restrictive discourses mathematics and mathematics learning and emphasizing their social and political construction and how they construct PSTs’ own mathematics teacher identities is particularly important because of the potential of these discourses to shape their identities and enactments.

## **Supporting PSTs in (Re)Authoring their Identities: Performativity and Deconstruction**

Performativity suggests that as identities are constructed within and shaped by languaged ideas, identities can also be deconstructed and reconstructed. Deconstructing or examining and unpacking dominant discourses that may restrict mathematics teacher to certain enactments may create opportunities for PSTs to (re)author their identities, accepting multiplicity and permitting “multiple convergences and divergences without obedience to a normative telos of definitional closure” (Butler, 1999, p. 22). That is, deconstruction as a process may support PSTs in taking up new understandings of self as mathematics teacher and teaching.

Applying performativity to PSTs’ mathematics teacher identities suggests that the insistence of a teacher identity comprised of dominant discourses about what teacher is, what mathematics is, or the role of the students may constrict change as teachers and PSTs push for coherence around certain practices or norms and feel unable to embrace different discourses, identities, or practices. For example, a discourse of mathematics as a set of skills may constrain a teacher from enacting a teacher identity that includes facilitating student-to-student dialogue because mathematics that is framed as skills and repetition may not support rich dialogue. A female PSTs’ identity, as how she sees and understand herself and her position as a female learner and female elementary teacher, may be within the discourse of female learners as “non-math people” (Mendick, 2005, p. 206); this may restrict her mathematics teacher identity and her teaching. By examining and questioning prevailing discourses, Butler theorized that when a singular, coherent definition of certain identities “no longer constitute the theme or subject of politics, then

identities can come into being and dissolve depending on the concrete practices that constitute them” (1999, p. 21-22). Understanding the discourses that shape identities and how identities are not unitary may allow new “becomings” of an identity.

Deconstruction, the act of engaging in a poststructural critique of language (Derrida, 1978), is a potential tool for PSTs to interrogate the discourses that shape identity: “Derrida’s deconstruction serves as a powerful tool for critiquing any structure and is, in fact, a practice of freedom that can help us rewrite the world and ourselves again and again and again” (St. Pierre, 2000, p. 483). Engaging in deconstruction is “dismantling metaphysical and rhetorical structures” (St. Pierre, 2000, p. 482) not only to tear them down but also to reinscribe and reconstruct language and identities (Butler, 1999). Deconstruction has the goal of “making visible how language operates to produce very real, material and damaging structures in the world” (St. Pierre, 2000, p. 481). Specifically, deconstruction is a means of interrogating performativity of identities or how discourses have power “to enact what it names” (Butler, 1999, p. 187). In PST education, deconstruction of mathematics teacher identities has the potential to engage PSTs in a process of foregrounding how individuals have constructed the world through language and cultural processes and also to provide opportunities for PSTs to deconstruct and reconstruct their mathematics teacher identities (Butler, 1999; St. Pierre, 2000).

### **Deconstruction and Agency**

By recognizing how identities are emergent, constructed, nonunitary, and shaped by discourses outside of individuals, different associations can come to define identities (Butler, 1999). That is, as PSTs understand their mathematics teacher identities differently, they may be able to reposition themselves towards particular teaching

practices. Specifically discussing gender identities, Butler (1999) emphasizes how an illusion of coherence around an identity conceals the discontinuities and differences within contexts. Thus, by highlighting how identities are constructed and how particular discourses need not shape them, Butler contends that the force of the unified identity is diminished or has less control over actions or enactments: “Paradoxically, the reconceptualization of identity as an *effect*, that is *produced* or *generated*, opens up possibilities of ‘agency’ that are insidiously foreclosed by positions that take identity categories as foundational and fixed” (p. 201). As an individual sees an identity as an effect, “as neither fatally determined nor fully artificial and arbitrary” (p. 201), there are opportunities for subversion of the discourses that frame identity.

Agency is theorized in this work (and the work of other post-structural feminists) because the discursive subject is not completely free. Performativity theorizes that the individual’s identity is continually shaped by discourses, but can also be shaped by taking up and embracing new practices that are available and reasoning about discourses (Butler, 1999). That is, an individual can engage in a new practice only when there is an opportunity for it and the new practice is available: “There is only a taking up of the tools where they lie, where the very ‘taking up’ is enabled by the tool lying there” (Butler, 1999, p. 199). Agency needs opportunity, and within available discourses, individuals have opportunities to position themselves.

Positioning is an important element of Butler (1999) and post-structural feminist theories (Weedon, 1987). An individual can position his or herself or can be positioned in response to a discourse only if the position is made available: “Language and the range of subject positions which it offers always exist in historically specific discourses which



inhere in social institutions and practices can be organized analytically in discursive fields” (Weedon, 1987, p. 34-35). The subject positions available, as framed as within larger discourses, enable certain identities or do not. Post-structuralism defines agency for a subject from two angles, as a subject “exhibits agency as it constructs itself by taking up available discourses and cultural practices and a subject, at the same time, is subjected, forced into subjectivity by those same discourses and practices” (St. Pierre, 2000, p. 502).

The question remains of how to provide tools of agency that support alternative positionings and what constitutes a subversive repetition within a practice: “What enables the exposure of the rift between the phantasmatic and the real?” (Butler, 1999, p. 200). What within PST education would expose how discourses are shaping identities and are not static or permanent forces? How does teacher education support understanding the implications of this or how to engage in different enactments? In her discussion of gender identity, Butler suggested that parody, or drag, specifically, may open up this rift. The critical task first is “to locate *strategies* of subversive repetition” (p. 201) and to “affirm the local possibilities of intervention through participating in precisely those practices of repetition that constitute identity and therefore present the immanent possibility of contesting them” (p. 201, emphasis added).

Recognizing the prevailing discourses in mathematics teaching and the ways in which they influence self and students may be crucial first steps towards supporting PSTs in (re)authoring identities. Performativity would ask PSTs to consider how these discourses and their positioning restrict their identities and thus their enactments: “What kinds of agency are foreclosed through the positing of an epistemological subject

precisely because the rules and practices that govern the invocation of that subject and regulate its agency in advance are ruled out as sites of analysis and critical intervention?” (Butler, 1999, p. 197). How is PST agency closed off or how are PSTs confined to being a certain type of teacher because their teacher identity is not analyzed? If PSTs shift from seeing identity as a unified entity and instead see identity as within practices of signification or within the actions they take, the theoretical premise of performativity suggests there are opportunities for analyzing identities as related to practices and taking up new enactments as available. That is, understanding identity as a practice, “a signifying practice” (p. 198) resulting from “rule-bound discourses” (p. 198) that operate within contexts may support agency (Butler, 1999). Conceptualizing identity as a “regulated process of repetition” (p. 198) means that agency is “located within the possibility of variation on that repetition” (Butler, 1999, p. 198). Davies (2000) is consistent with Butler:

By making visible the ways in which power shifts dramatically depending on how subjects are positioned by and within the multiple and competing discourses they encounter, they can begin to imagine how to reposition themselves, realign themselves, and use the power of discourse they have to disrupt those of its effects they wish to resist. (p. 180)

In order to support individuals in this deconstruction, the task is to reinscribe the possibilities that already exist but are seen as impossible (Butler, 1999). To support this process in this research and related seminar, the task is to support PSTs in naming and languaging discourses, understanding their implications, and relate these understandings to their understandings of self and teaching.

## **Operationalizing Deconstruction in Mathematics PST Education**

I propose a theoretical framework for the implementation of this work in mathematics education for PSTs, and I also detail the role of reflection and specific activities in order to operationalize deconstruction in mathematics PST education.

**Theoretical framework for the design and implementation of deconstruction in mathematics teacher education.** The implementation of activities designed to support the deconstruction of teacher identities and specifically PSTs' understandings of themselves as mathematics teachers and of teaching in context is situated within a framework that builds from critical pedagogy, poststructuralist feminist thought, performativity, and the concepts of discourses and positioning. The early stance of critical pedagogy stems from work by Freire (2000), Giroux (1991) and McLaren (2003).

Freire (2000) argued that education has been framed as “an act of depositing, in which students are the depositories and the teacher is the depositor. Instead of communicating, the teacher issues communiqués and makes deposits which the students patiently receive, memorize, and repeat” (p. 72). This banking approach does not encourage students to engage in critically considering their reality, and Freire proposed “problem-posing” or “liberating education” (p. 81), where students are “critical co-investigators in dialogue with the teacher” (p. 81). Giroux (1991) suggested engaging students in active self-investigating that is beyond self-reflection and includes reflecting on race, gender, and class as specific constructs and on “the diverse ways in which their experiences and identities have been constituted in different historical and social formations” (p. 48). Freire (2000) and Giroux (1991) are consistent with Derrida (1976), who suggests that meaning is the product of language, constructed out of and subject to

the continuous play of differences between signifiers; that is, meaning can never be fixed. Problem-posing education affirms that students are “beings in the process of becoming, as unfinished, uncompleted beings in and with a likewise unfinished reality” (Freire, 2000, p. 84). Poststructuralist feminist thought also emphasizes that awareness of one’s own personal domination is not all that is necessary; it is also important to see these dominations, discourses, and power structures within the wider social and historical contexts and engage in transformations of self, community, and society (St. Pierre, 2002).

Ellsworth (1989) defined one goal of critical pedagogy as “a critical democracy, individual freedom, social justice, and social change...Students would be empowered by social identities that affirmed their race, class and gender positions, and provided the basis for moral deliberation and social action” (p. 300). Critical pedagogy may be a way to demarginalize groups that have been marginalized through a “focus on the issues of difference in an ethically challenging and politically transformative way” (Giroux, 1991, p. 48). Difference can be incorporated into a critical pedagogy “as part of an attempt to understand how student identities and subjectivities are constructed in multiple and contradictory ways,” and identity can be “explored through its own historicity and complex subject positions” (p. 48). There is also political element to a critical pedagogy, which emphasizes the self as a site of politicization: “How the self is constructed in multiple and complex ways must be analyzed both as part of a language of affirmation and a broader understanding of how identities are inscribed in and between various social, cultural, and historical formations” (p. 54). Similarly, Butler (1999) and St. Pierre (2000) emphasized the relationship between the personal and the political and how awareness of the political supports self-understanding.

The goals of critical pedagogy and its emphasis on political and social constructions relate to PSTs' identities. Engaging PSTs in talking about how identities are shaped by discourses about gender, race, and class can support PSTs to "extend their understandings of themselves and the global contexts in which they live" (Giroux, 1991, p. 54) and "offers a language that allows them to reconstruct their moral and political energies in that service of creating a more just and equitable social order, one that undermines relations of hierarchy and domination" (p. 54). That is, students must be given tools to understand themselves and their surroundings. A critical pedagogy engages students in asking how and why knowledge gets constructed the way it does, specifically "how and why some constructions of reality are legitimated and celebrated by the dominant culture while others are clearly not and... how our everyday commonsense understandings—our social constructions or 'subjectivities'—get produced and lived out" (McLaren, 2003, p. 72). These ideas and questions provide a framework for implementing activities for supporting PSTs in understanding, deconstructing, and enacting their mathematics teacher identities.

While "critical pedagogy has worthwhile goals and helpful insights, if used uncritically, however, it can also be harmful" (Kumashiro, 2000, p. 40). Specifically, the "key assumptions, goals and pedagogical practices fundamental to the literature on critical pedagogy... are repressive myths that perpetuate relations of domination" (Ellsworth, 1989, p. 289). Critical pedagogy may ignore certain issues, such as gender, by not engaging with specific feminist theories or concerns and by appeals to grand narratives (Luke, 1992). Since an educator is charged with helping students to identify and choose certain positions, the educator may be simply pushing a viewpoint on students

(Ellsworth, 1989), and a critical pedagogy could “read as humanist discourse of progressivism rewritten in the language of critical theory” (Luke, 1992, p. 38). Thus, emancipatory action in the classroom needs to include critique and understanding of larger discourses and institutionalized gender and power relations (Luke, 1992), which is consistent with Butler (1999) and an emphasis on both the importance of building understanding of identities as situated within these dominant discourses and the subsequent deconstruction of identities not politics.

To address criticisms of critical pedagogy, Kumashiro (2000) encouraged teachers and teacher educators to work against this essentialization or getting students to think and act in a particular way:

Critical pedagogy needs to move away from saying that students need this/my critical perspective since such an approach merely replaces one (socially hegemonic) framework for seeing the world with another (academically hegemonic) one. Rather than aim for *understanding* of some critical perspective, anti-oppressive pedagogy should aim for effect by having students engage with relevant aspects of critical theory and extend its terms of analysis to their own lives, but then critique it for what it overlooks or for what it forecloses, what it says and makes possible, as well as what it leaves unsaid and unthinkable. (p. 39; emphasis in original)

A pedagogy that only encourages awareness of certain constructs may not lead to transformation or action, but making connections to their own lives and engaging in critique encourages change: “Critical knowledge and thinking is what impels students toward action and change, toward resisting and challenging oppression” (p. 37). The goal

is not to get students to a predetermined understanding of a certain content, but rather, the goal is for student self-reflection, where the student asks how he or she is positioned and how others are positioned within discourses, “in which the student brings this knowledge to bear on his or her own sense of self” (p. 45). Consistent with Kumashiro (2000), Butler (1999) suggested that awareness supports agency, but a person must engage in new practices that disrupt other associations. That is, from the awareness of the performativity of a certain identity and its underlying discourses and its implications, there is an emphasis on resignifying. This discussion grounds the framework of the seminar implemented with the PSTs in this study. The goal was not to have PSTs think one particular way about these discourses, but to have PSTs think differently about their mathematics teacher identity, informed by these theories of performativity, positioning and discourses. Activities did not only engage PSTs in determining if certain discourses were present, but also engaged them in identifying and understanding how they operated and encouraged new positioning (e.g. Kumashiro, 2000).

In one example of a critical pedagogy that embraces ideas of deconstruction and decentering, Vavrus (2009) engaged students in decentering normative heterosexuality. The purpose of the course was to “help education students... to examine how their own sense of sexuality and gender identification is imbued with various degrees of compulsory heterosexuality and the resultant problematic effects this can have for all young people at various stages of identity development” (p. 384). Vavrus asked students to decenter gender specifically, while this research aimed to have PSTs decenter or deconstruct their teacher identities. That is, my goal was for PSTs to learn something from the engagement “which is of a different order than learning something about it”

(Britzman & Pitt, 1996, p. 119). My goal was not to highlight all of the discourses and oppressive structures that shape teaching, education, or PSTs' identities, but instead to understand what discourses the PSTs are attending to; rather than asking, "Are they noticing what I want them to notice?" I asked, "What are they noticing?" and then subsequently, "How do they see these discourses as part of their identities and their teaching?" (e.g., Britzman & Pitt). I was interested in exploring the different dynamics of PSTs' self-understandings; how PSTs associated with, took up, explored, or resisted particular discourses or self-understandings; and "what shape these investments were taking as they became tied to questions of pedagogy" (Britzman & Pitt, 1996, p. 122).

**Role of the facilitator.** Consistent with Ellsworth (1989), I made these goals clear to participating PSTs. I wanted to make prevailing discourses visible to PSTs, but I acknowledged that the discourses that they feel have shaped their identities are not mine and my position on them was not the focus. Again, the goal was to support PSTs in surfacing social and historical discourses that they feel influence their views of teaching, learning, mathematics, and education, more generally, and to open a space for PSTs to make connections between these discourses, their identities, and their teaching decisions and enactments. As a facilitator, I encouraged communication across differences and emphasized that "a multiplicity of knowledges are present in the classroom as a result of the way difference has been used to structure social relations inside and outside the classroom, but that these knowledges are contradictory, partial and irreducible" (Ellsworth, 1989, p. 321). This is consistent with a conceptualization of identity as emergent and in process:



Identity in this sense becomes a vehicle for multiplying and making more complex the subject positions possible, visible, and legitimate at any given historical moment, requiring disruptive changes in the way social technologies of gender, race, ability, and so on define ‘Otherness’ and use it as a vehicle for subordination” (Ellsworth, 1989, p. 322).

Opening up the notion of identity to include multiplicity or recognition of the many discourses that shape it may support PSTs in seeing different subject positions available and may provide PSTs with a vehicle for change.

As conceptualized in this study, deconstruction does not celebrate fragmentation, where fragmentation of self suggests lack of cohesion about who one is and is marked by pain and confusion that is destructive or not productive for growth (e.g., Layton, 2000). The approach used in this study, similar to a psychotherapeutic approach (Cooper-White, 2008), seeks to support PSTs in highlighting and understanding the multiple discourses within which PSTs’ identities are constructed, but does not push for fragmentation or for an integration of these discourses or identities into a homogenized whole; each discourse or element could remain distinct (Cooper-White, 2008). An orientation towards multiplicity supports deconstruction because it recognizes how teacher identity has many elements and distinctive parts, and avoids totalizing claims of one identity (Ellsworth, 1989). I sought to support this process and a positive view of multiplicity through readings, writing prompts, and discussions.

**Reflection and facilitated opportunities for deconstruction.** The process of deconstruction involves reflection and active participation of individuals. While teacher reflection is consistently hailed as a critical element for improving teacher capacity (e.g.,

Howard & Aleman, 2008; Schön, 1983; Thompson & Zeuli, 1999) and particularly for supporting PSTs in being reflective about their teaching decisions (e.g., Goodman, 1988), teacher reflection is ill defined, and through the years, it has “has suffered from a loss of meaning” (Rodgers, 2002, p. 843). In this research, reflection involves “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends (Dewey, 1933/2008, p. 118). Consistent with Dewey (1933/2008) and Rodgers’ (2002) characterization of reflection, I call this process critical self-examination, where PSTs actively reflect on and discuss the discourses that they have highlighted as shaping their understandings of self as mathematics teacher. It involves first attending to the discourses, constraints, and expectations that shape identities, disentangling them, analyzing their relations to self, and responding to the process by reflecting on discourses, identities, and their implications. Dewey suggests that the individual “can think reflectively only when one is willing to endure suspense and to undergo the trouble of searching” (p. 124), and the deconstruction and critical self-examination that PSTs were asked to do in this seminar required related strengths of PST effort and commitment.

I contend that through this critical self-examination, PSTs may be able to see their identities not as unitary but as contextual, emergent, and shaped by these discourses. Consistent with a Vygotskian (1934/1986) approach to learning, critical self-examination may support PSTs in the transition from thought to word by engaging PSTs in uncovering discourses and norms that had not discussed or contested and labeling these ideas as constructs and then interrogating these discourses and the ways in which they shape his

or her self-understandings, relating these new understandings to themselves and their teaching. Reflection is critical part of transformative teacher learning, but it is a tool not an endpoint: “Reflection is not an end in itself but a tool or vehicle used in the transformation of raw experience into meaning-filled theory that is grounded in experience, informed by existing theory, and serves the larger purpose of the moral growth of the individual and society” (Rodgers, 2002, p. 863).

I organized PSTs’ reflection around specific activities in order to support the process of deconstruction. Activities first provided opportunities for PSTs to reason about prevailing discourses and their positioning, setting a “a scene to state particular kinds of problems rather than a content meant to cure the preconceptualized problem” (Britzman & Pitt, 1996, p. 122). In this manner, this pedagogy was more “exploratory rather than content driven” (Britzman & Pitt, 1996, p. 122) because of the goal of encouraging the critical self-examination, reflection, and connections.

Research on teacher identity suggests familiar techniques and structures such as, journals, autobiographies, teacher study groups, book groups, action research, and collaborative research, for use in teacher education (e.g., Rodgers & Scott, 2008). Opening classroom dialogue for secondary mathematics PSTs to attend to emotions, for example, may give PSTs a space for emotional response that can support learning about teaching for social justice (Boylan, 2009). Similarly, being required to examine their own thinking may have supported PSTs’ understanding of their own instructional practice (Artz, 1999), although I contend that connections to social and political contexts of teaching are necessarily. Van Zoest and Stockero (2008) emphasize connecting to PSTs’ initial conceptions in order to support their learning, and they encouraged PSTs to

“push their thinking beyond superficial observations and prompt them to carefully consider the root of their beliefs” (p. 2040). The practice of scaffolding supported PSTs in explaining elements of their identity more clearly and providing more evidence in their final work, however it did not engage PSTs in interrogating the dominant discourses that may have shaped their beliefs or identities. Engagements during the seminar needed to both confront PSTs’ notions of mathematics teacher, which may “appear to be an already completed role” (Britzman, 1993, p. 33) and situate these understandings in practice.

Research in teacher education supports critical self-reflection and outlines particular practices. Reflection-in-action, as discussed by Schön (1983) emphasizes the importance of teacher reflection on actions while in action, and how this is an important practice that can support teachers in thinking differently about learning and teaching. In this seminar, PSTs viewed video cases and read vignettes of teaching, but there were not opportunities to reflect on their own practice in action. Analysis of video cases or vignettes can focus reflection on critical elements and structure the situation (e.g., Schön, 1983). PSTs reflected on their artifacts of practice, such as student work and their lesson plans as a means to ground their reflection; discussions centered on student work have been shown to elicit rich conversations between teachers about pedagogy, student thinking and learning, and mathematics (Ball & Cohen, 1999; Kazemi & Franke, 2004) and may support PSTs in deconstruction as well. Stinson and Powell (2010) found that deconstruction through reading and reflective writing allowed mathematics teachers to think differently about their mathematics teaching and served as a tool for supporting mathematics teachers to interrogate both traditional mathematics teaching and the discourses that define their mathematics teacher identities. Similarly, through attention to

discourses and positioning, “helping teachers make visible the power in the discourses they use and illustrating to them that they can make some choices about their own identities...is one way to work towards social transformation” (Marsh, 2002, p. 467). Analyzing discourses within which educators, including PSTs, speak and act may provide them with a “powerful analytical tool to draw upon as they continue their work in school settings” (Marsh, 2002, p. 467). Activities in this seminar were also opportunities for PSTs to raise questions power structures and their relations to their teacher identities and teaching practices, and PSTs’ awareness of certain inequities or power dynamics may encourage PSTs to make connections to themselves and their teaching<sup>1</sup>.

Some explicit strategies for engaging secondary mathematics PSTs in discussion about discourses and social semiotics to support teaching for social justice were developed and implemented in secondary mathematics methods courses (de Freitas & Zolkower, 2009). De Freitas and Zolkower engaged PSTs in closely examining teacher talk and language use and created opportunities to discuss how students were positioned in relation to the mathematics and their opportunities to learn. If extended to each PST’s own identities, this focus on language as a way to interrogate discourses may engage PSTs in deconstruction of identities. However, this work has not been used with elementary PSTs, who are often positioned by discourses differently than secondary PSTs. Martin and Van Guten (2002) suggest that the insights the students develop through identifying, analyzing, and critiquing the conditions of their lives and others “empower them to challenge and alter oppressive conditions” (p. 51). PSTs conducted action research projects, where they investigated social issues, interacted with the community or engaged in experiences that differed significantly from their experiences in

---

<sup>1</sup> Specific activities and seminar objectives are outlined in Chapter 3.

their own race, gender or social class. From these activities, PSTs reflected on how this experience increased their understandings of issues of positionality and their “potential as change agents” (Martin & Van Guten, 2002, p. 51).

Understanding the complexity of their own identities and the discourses that influence them may support PSTs in understanding how their students are positioned and how their enactments of certain identities have implications for student learning. PSTs need to be given opportunities to relate these experiences and reflections to their teaching in order to “ground their new insights” from these reflective experiences “into their teacher identities” (Vavrus, 2009, p. 389). Recognizing the discourses may lead to noting the implications of the discourses and interrogating how these discourses are present in their own enactments. In this way, this deconstructive process can support PSTs in (re)authoring their identities in practice.

As PSTs shift in their understandings of his or her mathematics teacher identities, he or she may be able to ask better questions, to question constructions, and generally to face teaching scenarios differently, which may support understanding of mathematics teaching. That is, “attending to the ways we tell our story or tell our identity can help us see identity as contingent on context and power relations” (de Freitas, 2008, p. 53). Therefore, activities in the seminar were also explicitly related to mathematics teaching and offered PSTs opportunities to relate their self-understandings to teaching. Deconstruction may support PSTs in first being more critical in analyzing their own practices, providing tools of what to look for, and then subsequently engaging in new practices, subverting repetitions that they now cite as restrictive to student learning. Encouraging self-analysis and reflection within teacher education may prepare PSTs for

more equitable teaching practices (e.g., Howard & Aleman, 2008; Sleeter, 2008a).

Through an explicit process of deconstructing identities, PSTs may problematize past enactments within the classroom by noting the underlying discourses and positionings and then make different teaching and planning decisions.

### **Conclusion**

This review served to present the current literature on mathematics teacher identity and how the theoretical premise of performativity could fill a need in mathematics teacher education research and practice. In the following chapter, I detail how I designed a study and related seminar in response to the research and in line with this theoretical framework.

### Chapter 3: Research Design and Methods

#### Introduction and Research Questions

The purpose of this study was to explore how PSTs develop understandings of themselves as mathematics teachers and of teaching as situated in the complex realities of schooling and how these understandings shift through their participation in a seminar involving critical self-examination. For PSTs participating in a seminar on critical self-reflection and mathematics teaching in context:

- How are they understanding themselves as *mathematics teachers*? How are these understandings shifting?
- How are they understanding *mathematics teaching* in context? How are these understandings shifting?

I studied these questions within a seminar designed to engage a small group of PSTs in a process of *deconstruction*. In order to support their critical examination of themselves as mathematics teachers and teaching in context, I designed and facilitated activities to create opportunities for PSTs to *deconstruct* their understandings of themselves as mathematics teachers and of teaching and to encourage PSTs both to be reflexive about their positioning as a mathematics teacher and to problematize mathematics teaching.

Four of the participating PSTs were each considered a case in my analysis of each research question. I used analysis across cases to understand how the seminar supports critical self-examination and PSTs' understandings of themselves as mathematics teachers and teaching and the theoretical premise of performativity and deconstruction as it relates to mathematics teacher education. This chapter presents information about the research design, study context, seminar design, and data collection and analysis. As the



researcher and seminar facilitator, I interacted with PSTs in the sessions as well as observed them as they interacted with each other; my role and the seminar sessions are also explained in detail in this chapter.

### **Research Design**

The research design of this study is characterized as design-based research (DBR). Cobb, Confrey, diSessa, Lehrer, and Schauble (2003) suggested that DBR has at least four common features, including that it is intended to develop theories of learning and teaching; is built around a hypothesized learning process and test-driven conjectures; takes place in naturalistic settings; and is iterative and interventionist. Consistent with DBR's focus on theory and investigating theories of teaching and learning (e.g., Cobb et al., 2003; diSessa & Cobb, 2004), this study sought to develop and engage the theoretical premise of performativity and deconstruction in the seminar as grounded in mathematics teacher education, teaching practice, and PSTs' current context. I designed a seminar and a set of instructional sessions around these premises and the role of critical self-examination in PSTs' developing understandings and facilitated the seminar to support PSTs in this process of critical self-examination. Deconstruction was the hypothesized learning process of this design, and there are particular test-driven conjectures, related to the seminar objectives, that I used in the analysis.

Incorporating the third feature of DBR, this study also took place as a seminar within a teacher education program, that is, amid "the buzzing, blooming confusion of real-life settings where most learning actually occurs" (Barab & Squire, 2004, p. 4). This study embraced the complexity of PSTs' current responsibilities and situations, where PSTs were working in a classroom with a mentor teacher to whom they are accountable

and also engaged in other coursework; a change in one part of a system, such as a mentor teacher's plans or a PST's coursework, may influence the entire system of engagement with the work on identity and teaching. My design accounted for this by being responsive to PSTs' needs, for example, their need for particular supports in writing their narratives and their requests to talk about the challenges of their internships and other program requirements, such as their final portfolio. These conversations were not part of my intended plans, but they were important for PSTs and for their engagement with both their identity work and in the seminar. I also modified written prompts, assignments given to PSTs, and our meeting times in order to make the seminar a productive, but not overly burdensome, opportunity for PSTs. That is, the seminar had explicit purposes and structured activities, but I had flexibility in structuring activities and was able to modify and revise our work sessions to be responsive to the participating PSTs. While there was only one iteration of the seminar, I embraced the interventionist nature of DBR, following Cobb et al. (2003) and the manner in which real-time refining in line with theory is appropriate and part of engaging in effective instruction.

Furthermore, integrating the emphasis on theory and naturalistic settings, Barab and Squire (2004) emphasized that DBR seeks to advance theory as well as have an impact on the local level:

Design-based researchers not only recognize the importance of local contexts but also treat changes in these contexts as necessary evidence for the viability of a theory. Design-based research that advances theory but does not demonstrate the value of the design in creating an impact on learning in the local context of study has not adequately justified the value of the theory. As such, design-based

research suggests a pragmatic philosophical underpinning, one in which the value of a theory lies in its ability to produce changes in the world. (p. 6).

Consistent with Barab and Squire, this study was interested in fostering development of useful constructs, testing and refining the theoretical premise and constructs, and also understanding the local impact, in this case, on these particular PSTs. The analysis focused on PSTs and used PSTs' developing understandings of self as mathematics teacher and of their mathematics teaching to better understand performativity and deconstruction.

### **Study Context**

The study participants were students who were currently enrolled in an elementary Master's certification program (ElTeach<sup>2</sup>) at a large university in the mid-Atlantic region. Ten students volunteered to participate in the study and related non-credit seminar. This section presents details of the ElTeach program (including coursework, internship, school settings, and requirements), participating PSTs, and my access to this site. In this section, I outline the ways in which different elements of context served as constraints and affordances for this study and how I negotiated these elements.

**ElTeach program coursework.** The ElTeach program is an intensive, 13-month, full-time elementary Master's certification program for individuals who have already earned a baccalaureate degree. The program emphasizes teaching for understanding, inquiry, and reflection in the coursework and during the internship, as expressed in the mission statement (Appendix A). The ElTeach program's stated focus on students,

---

<sup>2</sup> All names of school and university programs, participants, teachers, instructors, schools, and school districts are pseudonyms.

student learning, and inquiry into teaching are consistent with the seminar's focus on inquiry into self, teaching, students, and the ways in which students are understood.

The ElTeach program begins in June, and students take three courses during the summer term. In the fall, students take four courses, including mathematics methods, two days a week and are immersed in a yearlong internship in an elementary school three days a week. In both the mathematics and science methods courses, there is explicit attention to understanding teaching as active responsiveness to student thinking. Students also take an internship practicum course led by university supervisors that meets once a month. In the spring semester, students are immersed in their internship for five days a week, but are released early on one day each week for two evening courses. Students meet monthly with their advisor to address their action research projects, and they take a Capstone course in the final summer. Upon completion of the program, students earn a Master's of Education and are eligible for state certification to teach in elementary schools.

This ElTeach program was well suited to be the context for this study because its focus on elementary teacher preparation. Many elementary teachers and PSTs have complicated relationship with mathematics (e.g., Drake, 2006; Gellert, 2000). For example, research suggests that elementary PSTs' negative experiences as students led them to want to teach mathematics in a "nice and amusing way" (Gellert, 2000, p. 258). Research also found that elementary PSTs saw rules, procedures, and right answers as defining mathematics (e.g., Llewellyn, 2009). In those situations where this is the dominant discourse of mathematics, it influences how teachers teach or, as Llewellyn suggests, may lead to a teacher who "is heavily restricted and deeply dictatorial" in her

approach to mathematics teaching (Llewellyn, 2009, p. 418). Across grade levels, mathematics teachers have difficulty in identifying the political implications of mathematics teaching (de Freitas, 2008). This suggests a widely-held view of mathematics as culturally neutral, despite multiple discourses around mathematics teaching and learning and how they are distinct from the discourses of other disciplines (Ernest, 2004). Many beginning elementary teachers see themselves as and need to perform as generalists because they teach different disciplines, and thus they need encouragement to see mathematics as having a discourse of its own and the influence that they have over the teaching of mathematics in their classrooms (Brown & McNamara, 2005). There is a need for more research on how to support elementary PSTs in understanding themselves as mathematics teachers.

**My access to this program.** My relationship with 2009-2010 EITeach cohort was first as one of the instructors of their mathematics methods course. Many of the study participants were my students in a section of their mathematics methods course in Fall 2009. Having had a prior relationship with the PSTs may have enabled more open dialogue for talking about issues of identity, mathematics, and teaching than I would have been afforded if I were not already connected to the PSTs and the program. That is, my access to this program also increased its appropriateness for this study. In our sessions, my role as former instructor seemed to bring a sense of familiarity and camaraderie, as, for example, PSTs were interested in my family, and I was interested in how their experiences in their internships and courses had developed. PSTs also asked me for support in designing their mathematics lessons during takeover and appreciated having someone involved in the Capstone course and portfolio development process who had a

connection to their methods courses. That is, my status as a methods instructor, and perhaps more specifically, as an instructor who knew their past learning experiences, positioned me in different ways than the other Capstone instructors who had not taught the PSTs. More generally, I was positioned as an instructor by the University, which also gave me access to information about program requirements.

My position as a former course instructor, however, may have created a power dynamic where some participants were not comfortable in sharing their ideas, their concerns, or honest feelings. Some students may also have chosen to participate because of their interests in job-related recommendation letters. I was conscious of the potential for other power dynamics and sought to address them as best as possible. I worked to establish myself as someone who was interested in how they were thinking about themselves and their personal development, in addition to my interest in their mathematics teaching practices. I was explicit in my desire, as a researcher, to understand their interactions with the seminar activities and that there were not correct responses to these activities. I emphasized how their involvement in the study should support their own growth and understanding, and while related to the program, their involvement was not related to grading, letters of recommendation, or completion of requirements. In the seminar, I served as facilitator and researcher, and I detail this role later in this chapter.

**Internship requirement.** In ElCert, the internship begins in the Fall semester with limited teaching and continues through the Spring semester with a gradual increase in responsibility. Each PST typically has one mentor teacher for the whole year. In the Fall semester, PSTs are in their internship for two days a week, observing students and

their mentors and assuming limited classroom responsibilities following a set schedule. Typically, by the end of the Fall semester, PSTs are expected to teach one full lesson a week. In the Spring semester, PSTs plan and teach more lessons and are expected to “take-over” the classroom for a period of four to six weeks. During “take-over,” each PST is responsible for lesson and unit planning in all disciplines, as well as teaching, grading, and other responsibilities as determined by the mentor teacher. Each mentor-PST relationship is different, and this relationship influences PSTs’ responsibilities, engagements, and general satisfaction with the program. PSTs are evaluated in their internship both by their mentor teachers and university supervisors. The evaluation of the PST in field placement is critical: Failure to meet expectations in the internship results in failure to be awarded the teaching credential.

**Internship sites.** PSTs intern at an elementary school in one of three local school districts: Eastern County Schools, Graverly County Schools, and Haverford County Schools. Educational reforms and the resultant accountability systems created a high-stakes accountability context at each of the elementary schools in these counties. A high-stakes accountability context is characterized by public pressure to improve school performance particularly on standardized exams (e.g., Rinke & Valli, 2010), and this emphasis on higher standards and higher test scores hits the realities of schools and the populations they serve (Apple, 2004). Research findings suggest that high-stakes accountability policies give rise to instructional methods to support test achievement, a narrowed curriculum (“teaching to the test”), and a “test-driven school culture” (Valli, Croninger, Chambliss, Graeber, & Buese, 2008). In a test-driven school culture, where teaching quality and students’ learning are equated with high stakes test scores (Cochran-

Smith, 2005), teachers, administrators, and students feel the pressure of the importance of high student performance on these assessments. Teachers and PSTs in these schools report that they are subjected to these pressures.

**Portfolio presentation and Capstone course.** In addition to satisfactory progress in coursework and internship, exit requirements include a portfolio, a presentation of the portfolio, and accompanying written narrative, as well as performance-based assessments of their teaching and passing scores on the Praxis exams. Capstone course instructors discuss the narrative and portfolio requirements with PSTs beginning in the Fall semester. The ElTeach Program Standards (Appendix A) are used by University coordinators to guide communication about the portfolio and by school-based mentor teachers to discuss PSTs' progress in the internship. To complete the portfolio requirement, PSTs consolidate artifacts that demonstrate their realization of each standard, and they present their portfolio to University faculty at the end of June. In the presentation, PSTs are required to tie together their internship and coursework to the standards and to incorporate a theme describing their view of teaching, the classroom they envision, or who they are as a teacher.

The summer Capstone course is designed to support PSTs in compiling their portfolio and constructing their narrative. During the Capstone course, instructors assigned readings and related writing assignments, and they created working groups where PSTs could discuss their portfolio presentations and written narratives with each other. The seminar created for this study was linked to the Capstone course, with some



of the seminar sessions (Sessions 5, 6, and 8) taking place during the times set aside for working groups<sup>3</sup>.

Holding three seminar sessions during Capstone working group sessions, as well as meeting for two sessions after the Capstone course in the evening allowed PSTs an opportunity to participate in the seminar more easily than if we had met outside of the Capstone course. In this manner, the Capstone course and the portfolio and narrative requirement also created a space for seminar sessions and specifically for engaging PSTs in understanding themselves as mathematics teachers and their teaching. Seminar activities related to PSTs' portfolio and narrative development, for example, discussions about discourses framing mathematics teaching and their relations to and implications for teaching, directly relate to the narrative requirement of the program and the Capstone course. Participating PSTs said that they appreciated the seminar as a space to discuss dilemmas of teaching both specific to their classroom and more broadly, and the seminar filled their desire for further support as they developed their portfolio and narrative and reflected on their internship. PSTs' responses suggest that they felt meaningfully compensated for their involvement in this seminar and study. Additionally, this focused reflection on self and teaching and the opportunities to discuss and negotiate the challenges and tensions they may encounter teaching may serve to support PSTs' in their first year of teaching.

Meeting during Capstone and at times related to the Capstone course required coordination with the Capstone instructors who were also facilitating a course and needed flexibility in their scheduling. This required coordination and flexibility by all

---

<sup>3</sup> Seminar Sessions 1, 2, and 3 took place before the Capstone course began; Sessions 4 and 7 were held in the evenings after class. In Sessions 6 and 8, we met both during the working group times and also during the lunch break.

instructors. The Capstone course and portfolio requirement more specifically supported PSTs' self-reflection, but it defined what a final product of self-reflection would look like. In the seminar, I made distinctions between the critical self-reflection that we were working towards in our discussions and the ways in which this may or may not be a part of their final portfolio presentation. In this way, the portfolio may have served as a both a resource for PSTs' engagement in seminar and activities and a potential constraint to critical self-reflection, where, for example, PSTs may have felt uncomfortable questioning program requirements or particular ElCert standards in a final portfolio.

The Capstone course was a required course and included graded assignments, where the seminar was not required. As part of the seminar, I asked PSTs to complete written reflections after each session and submit any writings completed during the session, for a total of nine written pieces. Some PSTs used the written reflections from our seminar in their final portfolio presentations or in the accompanying narrative. None of the PSTs, however, submitted all of the writing assignments; most of the participants submitted seven of the nine reflections. As this course was not graded and other assignments for the Capstone course and their portfolio and presentation were, PSTs may have felt more pressure to complete the graded assignments and may have see the writing assignments as an additional burden that was not related to their course grade.

**Cohort.** Historically, the students in the ElTeach program are primarily immediately post-baccalaureate students, White and female, and with limited job experience; a majority of the students in this cohort were White and female and between the ages of 23 and 30. Specifically, 34 of the 36 students were female. Most of the students desired a position in a local elementary school after completing the program. Of

the 36 students who started in the 2009-2010 elementary cohort, 33 students completed the program and graduated in June 2010.

**Participants.** Eleven PSTs volunteered to participate in the seminar and study; ten PSTs participated in all sessions, and these ten were included in the analysis. The ten participating PSTs were all female, ranging in age from mid-twenties to early-thirties in age. One PST self-identified as African-American, one as an immigrant from Argentina, and 8 as White. All participating PSTs had placements in elementary school classrooms in large public school systems.

PSTs self-selected into this study and may have had many reasons for participating, such as desire for more time with a course instructor, need for support for their narrative project, or desire for more time with other PSTs. These participants may have been uniquely motivated or interested in their own self-reflection, in general. The participants as a group may be a unique subset of the entire cohort because of these reasons. Also, previous relationships, dispositions, and PSTs' personalities influence group dynamics and discussions. Identities are relational and will be analyzed within social context and interactions (e.g., Bucholtz & Hall, 2005) by analyzing full conversations, turn-taking, and other dynamics in a PSTs' discursive moves.

The participating PSTs were also students within a competitive program and job market, which may have influenced their participation in activities both during and outside of the course sessions. As PSTs were encouraged to think about their positioning and new teaching practices, some may be fearful of pushing against institutional norms or engaging in practices that they felt that their mentor teacher would not support. PSTs may have felt pressure to produce a particular final portfolio or narrative in order to

respond to the program requirements, even as they would have liked to share different elements of themselves. This dilemma of being positioned simultaneously as a student in education coursework, a visiting mentee in a mentor's classroom, and a teacher with her own classroom is not unique to these PSTs (e.g., Britzman, 1993, 2003; Jackson, 2001). I do not suggest that this project avoids the unique and complex positioning of PSTs. To support PSTs in negotiating these dilemmas, I encouraged PSTs to talk about these tensions, their intentions, and their teaching. In this study, I did not ask PSTs to engage in any specific teaching practices or seek to study their practice.

I chose four PSTs, identified as Candice, Brooke, Sarah, and Laura, for case analysis. These participants each had differing school placements and backgrounds: Candice is in her mid-twenties, self-identifies as African-American and interned in first, third, and fourth grade in an elementary school in Graverly County; Brooke is a White female in her early twenties and interned in a third grade classroom in an elementary school in Eastern County; Sarah is White female in her early thirties and interned in a third grade classroom in an elementary school in Graverly County; Laura is a White female in her mid-twenties and interned in a third grade classroom in an elementary school in Eastern County. These particular PSTs were chosen because of the different ways they understood themselves as mathematics teachers and teaching in context, how their understandings shifted in different ways, and their differing interactions with the seminar activities<sup>4</sup>.

### **Design Implementation and Seminar Overview**

This study involved ten PSTs in a seminar consisting of eight sessions during the final months of ElTeach. The eight 2-hour group sessions were held late March through

---

<sup>4</sup> More information about how I chose the focal cases is detailed in the final section of this chapter.

June 2010. The seminar was not a program requirement, rather ten PSTs volunteered to participate. The first three seminar sessions took place during the spring semester, outside of regular class time; the final five sessions took place during the Capstone course while PSTs prepared their portfolio and narrative.

Seminar sessions engaged the participating PSTs in *deconstruction*, a process of critical examination of their understanding of themselves as mathematics teachers, teaching, and the political and social discourses that shape their understandings. The theoretical premise guiding the seminar was that engaging PSTs in deconstructing their teaching contexts, expectations, and constraints and challenging PSTs to question them and the dominant discourses that frame mathematics teaching—the “culturally established lines of coherence” (Butler, 1999, p. 33)—encourages PSTs to be actively involved in the process of identity work. The theoretical framework behind the seminar is introduced in Chapter 1 and described in detail in Chapter 2. This section outlines the content of the seminar and related activities.

**Goals and objectives of seminar.** The primary goal of the seminar was to support PSTs in developing understandings of themselves as mathematics teachers and their teaching. Consistent with design-based research, I developed and explicated testable seminar objectives to orient analysis towards patterns and changes in PSTs’ engagement and thinking (e.g., Cobb et al, 2003). There were four seminar objectives:

- Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations;

- Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers;
- Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher; and,
- Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.

In the seminar, objectives were addressed across sessions.

**Overview of sessions.** I designed the seminar sessions to serve these objectives.

Across seminar sessions, PSTs engaged in opportunities to name prevailing discourses of mathematics teaching and learning, to discuss the implications of these discourses on how they position themselves and how they and others are positioned, and to question these discourses and positionings, in principle, opening up spaces for them to (re)author their understandings of being a mathematics teacher and teaching and to create new positionings.

I designed initial activities to encourage PSTs to identify different discourses of teaching, learning, and mathematics (Objective A), such as social discourses around race, class, and student abilities (e.g., de Freitas & Zolkower, 2009; Sleeter, 2008) and others detailed in Chapter 2. The learning goals of the seminar were focused on specifying and unpacking issues that emerged as salient for the participants as they engaged in the activities of the seminar and not focused on equitable teaching practices specifically. We discussed prevailing social, political, and institutional discourses and their implications

(Objective B) through analysis of cases, in relation to PSTs' personal experiences, and in written reflections. While some of the activities were designed to highlight issues related to race and class, the activities as a whole covered many issues related to the sociopolitical contexts of teaching and not all of the activities explicitly sought to address issues of equity.

I theorized that identifying discourses and their implications would help PSTs recognize the discourses that shape *their* understandings of mathematics teacher and to support an understanding of positioning. Rather than reaching a predetermined understanding of certain content, such as the role of race and privilege in the classroom (e.g. Howard, 2006), I sought to have PSTs question how they are positioned and how others are positioned within discourses and “bring this knowledge to bear on his or her own sense of self” (Kumashiro, 2000, p. 45). That is, sessions served to open possibilities for PSTs to position themselves differently and support their self-understandings (Objective C).

Across sessions, PSTs discussed their own mathematics teaching and their understandings of themselves as mathematics teachers in relation to these discourses. In this way, sessions were opportunities to support PSTs in recognizing how these discourses and positions relate to student learning and their enactments in their classrooms and in thinking critically about what they could do differently in their classrooms (Objective D). PSTs reflected on what they could do differently to address prevailing discourses that have problematic influences on students and learning, analyzing both their strategies and their intentions, consistent with Butler (1999) and the emphasis on acts of subversion as a means to influence identity. PSTs were supported in

problematizing current mathematics teaching practices as a way of subverting certain discourses and reconstructing their positionings.

During sessions, PSTs analyzed case studies, transcripts, and videos, which provided opportunities for PSTs to name and question prevailing discourses and positionings in relation to mathematics teaching and learning and to examine their own and others' practices (e.g., Cochran-Smith & Lytle, 1999). All activities and cases were situated in mathematics classrooms or mathematics teaching contexts. PSTs also responded to nine brief writing prompts, which I designed to relate in-class activities to their own positioning as mathematics teachers<sup>5</sup>. In facilitating the small group and implementing sessions, I responded to PSTs' in-class discussions and written prompts and modified sessions to be responsive to the PSTs as my students and also the research.

I organized sessions to support social interaction and group learning in order to facilitate the PSTs' development and negotiation of ideas (e.g., Vygotsky, 1934/1986). In discussions of teacher practice and development, group learning can open up teachers' knowledge for discussion and analysis (e.g., Fairbanks & LaGrone, 2006) and meeting as a small group allowed participants to talk together, build on each other's ideas, and negotiate their own ideas. Exploring questions of self and practice together may deepen and enrich teachers' understanding, while "setting the stage for transforming practice" (Fairbanks & LaGrone, 2006, p. 24). Also, as identities are relational, "never autonomous or independent, but always acquire social meaning in relation to other available identity positions and other social actors" (Bucholtz & Hall, 2005, p. 598), it was necessary to design sessions so PSTs could discuss and interact.

---

<sup>5</sup> Writing prompt examples are listed in Table 1.



Meeting as a group generated a sense of common cause (Kamberelis & Dimitriadis, 2008) and created spaces for PSTs to voice their concerns as well as strategize. Thus, sessions became legitimate and valued spaces where PSTs could speak and others would listen (Cook-Sather, 2002). Although the seminar had explicit purposes and structured activities, this seminar also served as a focus group, using Kamberelis and Dimitriadis's (2008) suggestion that focus groups can create multiple lines of communication and "create 'safe spaces' for dialogue in the company of others who have had similar life experiences and who are struggling with similar issues" (p. 389). In the context of this study, I encouraged both horizontal interactions, which occur between participants, and vertical interactions, which are between the researcher and the participants (Kamberelis & Dimitriadis, 2008). As facilitator, I also "worked the hyphen" (Fine, 1994) and recognized my role and responsibilities as participant-observer-facilitator-researcher. For instance, I shared my own experiences and struggles as a classroom teacher, when asked, but I sought to problematize my own responses and support PSTs in analyzing teachers' responses, including my own. In this manner, I positioned myself as a participant, as well as sought to facilitate PSTs' own problematizing.

Table 1 presents the session title, date of session, specific session objectives addressed (see lettered objectives above), and activities for each of the eight 2-hour sessions. This overview reflects a summary of the enacted and not the intended curriculum. Lesson plans for Sessions 1 through 8 are included in Appendix B. I reference this table as well as Appendix B in each case in order to support the reader in understanding PSTs' engagements as related to activities, prompts, and assignments.

Table 1. Overview of sessions.

Session (Date)	Objectives addressed	Activities
Session 1: Languaging discourses  (March 23)	A and B	<ul style="list-style-type: none"> <li>• Introduce study</li> <li>• Read and discuss <i>Algebra for All</i> case (modified from Crockett, 2008).</li> <li>• Discuss and name emergent social, political, and institutional discourses (e.g. discourse map, Alsup, 2006).</li> <li>• Reflective prompt: What is your vision of yourself teaching mathematics in five years?</li> <li>• Writing prompts: 1) How do these discourses—the ones that we talked about in Session 1 and any others—influence your teaching, yourself as teacher, or your students? 2) Where do you see these discourses in your classroom now?</li> </ul>
Session 2: Introducing positioning and situating discourses  (April 27)	A and B	<ul style="list-style-type: none"> <li>• Review prompts and observations</li> <li>• Introduce positioning with <i>Alchemy of race and rights</i> (Williams, 1991), <i>The paper bag princess</i> (Munsch, 1992), and definition from Davies and Harre (1990)</li> <li>• Read <i>Angela, Mrs. Carlton, and Benjamin</i> case (modified from Crockett, 2008).</li> <li>• Reflect on positioning as a mathematics teacher and revisit discourse list</li> <li>• Writing prompts: 1) How do you feel positioned as a math teacher or in your math classroom? And how do you position yourself as a math teacher or in your math classroom? 2) Reflecting back on how Angela is positioned, how she positions herself and how she positions others, what would you do in her place? Why? Be specific.</li> </ul>
Session 3: Implications of positioning on students and teachers  (May 11)	B and C	<ul style="list-style-type: none"> <li>• Map social, political, and institutional discourses present in <i>Angela, Mrs. Carlton, and Benjamin</i> case (modified from Crockett, 2008), and discuss implications on individuals.</li> <li>• Transcript and case analysis of <i>Teacher A and Teacher B</i> (modified from de Freitas &amp; Zolkower, 2009)</li> <li>• Writing prompt: 1) During this week, similar to what we did today, take time to reflect on <i>two</i> different scenarios and map the relationship between the discourse that you see, the teacher(s), and the student and any other possible actors or elements (such as mentor teacher(s), you, intern(s), administration, etc, if applicable).</li> </ul>
Session 4: Teaching as situated in contexts  (May 18)	C and D	<ul style="list-style-type: none"> <li>• Examine artifacts as evidence of teaching, first at the concrete level, then as evidence of practice, and then as created and situated within contexts.</li> <li>• Writing prompt: 1) Reflect on our work so far. This is a chance for me to know more about how I can think about our time together. Some questions to guide you: Have these meetings helped you think about mathematics teaching or yourself as a mathematics teacher? If so, how? What have you learned so far about yourself as a mathematics teacher? What do you still want to learn? What do you have questions about? 2) Detailed written response on artifact of teaching.</li> </ul>

Session 5: Teachers in contexts  (May 25)	C and D	<ul style="list-style-type: none"> <li>• Case analysis of <i>Mary Hurley</i> (Carnegie Foundation for the Advancement of Teaching, 2006). Implications of accountability contexts on teaching, students, and self.</li> <li>• Writing prompt: 1) Revisit your response (after Session 2) about how you are positioned and how you position yourself as a math teacher or in your math classroom. Thinking about our recent conversations and discussions, your artifacts, the transcripts and reflections from other teachers, and your mappings, add to and revise what you wrote, adding new positionings or discourses that frame your teaching, as necessary. Then, reflect on your revisions. That is, think about why you are making these changes and/or what made you think about your positioning differently.</li> </ul>
Session 6: Students in context and problematizing teaching  (June 1)	B, C, and D	<ul style="list-style-type: none"> <li>• Viewing of <i>The Wire</i> (Zorzi &amp; Hemingway, 2006) episode and whole group discussion</li> <li>• Writing prompt: 1) We've been focusing a lot on <i>your</i> positioning both as a teacher and an intern. What we've seen today is how both students and teachers are embedded in layers of context and discourses. Think about your own experience, you as a teacher, and the students that you work with. Are there other discourses and positions that we have not mentioned that you feel position your students in different ways or that students use to position themselves? How? Where do you see these in your classroom or in your lessons?</li> </ul>
Session 7: Reauthoring  (June 8)	B, C, and D	<ul style="list-style-type: none"> <li>• Discussion of narrative and small group discussions of narratives</li> <li>• Writing prompt: 1) Revisit your math autobiography and "good math teaching" ideas [Original assignment in Appendix I]. During math methods, you added comments to your original ideas about good math teaching that you wrote in September [Original assignment in Appendix J]. Now, go back to the one that you wrote in December and add to, revise, and make comments on <u>both</u> the autobiography part and the second part about good math teaching. Use track changes when you add new text and also highlight specific parts and make comments. Then, reflect on your revisions; that is, think about why you are making these changes and/or what made you think about your positioning differently.</li> </ul>
Session 8: Revisiting  (June 15)	B, C, and D	<ul style="list-style-type: none"> <li>• Discussion of vision statements</li> <li>• Individual and small group work on narratives</li> </ul>

**Key Activities.** Six activities from the sessions emerged as particularly important in terms of how PSTs' developing understandings themselves as mathematics teachers and teaching; PSTs' reactions and interactions to these cases are discussed in detail in the

analysis. I provide details of the case and the rationale here in order to introduce the reader to the activities and to support the reader's understanding of the case analysis. The complete set of materials for each of the key activities is in the Appendix (Appendices C through J).

***Algebra for All (Session 1).*** PSTs read the *Algebra for All* case (modified from Crockett, 2008) in Session 1. In this vignette (Appendix C), teachers react negatively to a new state mandate that all 8<sup>th</sup>-grade students take Algebra 1. I chose this vignette to provoke consideration of prevailing school discourses of mathematics as a process of following procedures and memorizing rules; the politicized nature of mathematics or mathematics role as “critical filter” (e.g., NCTM, 1989); institutional discourses of accountability, such as curriculum mandates; and social discourses of low expectations of particular groups of students.

The vignette provided details about the school's reputation, the student population, and the changing demographics:

For years Orange Valley Middle School has been regarded as the city's equivalent of a private, elite school. It boasted of its high test scores, its rigorous curriculum, and the fact that it was a feeder school into the city's prominent high school that served primarily the White children of doctors, lawyers and professors of the local university. Orange Valley's students had come from middle class homes, some of modest wealth. Until recently, the school had served a predominantly White student population. Even today, its teaching staff comprises mostly White teachers.

In recent years, the community has undergone what old timers in the neighborhood and veteran teachers perceive as rapid demographic changes. In reality, the changes were more gradual. Elderly members began moving into retirement communities and many families began to “move up,” buying into more expensive neighborhoods. As these families moved out, working- and middle class African American and Latinos and some White first-time buyers moved into the neighborhood. At the same time, the school district instituted boundary changes to accommodate enrollment increases in other parts of the city. The new boundary included Latinos from poorer parts of town. As a result, Orange Valley saw an increase in the number of students who are African American and Spanish-speaking immigrants. (Crockett, 2008, p. 24-25)

In this vignette, the socioeconomic and racial backgrounds of the school’s student population is changing from predominately White and middle class to include more students of color and students from lower socioeconomic classes.

Teachers in the vignette suggested that some students would struggle with the “higher-level thinking” or did not need Algebra 1. In particular, Mr. Jones, a teacher in the vignette, stated the following:

I have trouble with what the state wants us to do. I think it will be very harmful. Not all kids are capable of learning algebra, just the lower level skills. It’s harmful to their self esteem to force algebra on them. Take Rojelio, for example. He’s a kid in my class, very average. This kid probably isn’t going to college. It’s unfair to make him take Algebra 1. He’s never going to use it. (Crockett, 2008, p. 26)

Mr. Jones questioned not only *what* mathematics should be taught, but also *who* should be taught mathematics. Statements such as the ones made by Mr. Jones are representative of a view of mathematics as exclusive to particular students, which pervades school mathematics (e.g., Stinson, 2004).

Stinson (2004) followed the history of how certain students are excluded from mathematics and the resultant “gatekeeping” role of mathematics. He suggests that initial debates centered on who was prepared for algebra, which then led to an increase in grouping students by ability and the exclusion of female students, poor students, and students of color from the opportunity to enroll in advanced mathematics courses. Through both qualitative and quantitative studies, Stinson and many others in mathematics education substantiated the claim of mathematics as gatekeeper, or how the lack of opportunities to engage in advanced mathematics may restrict students’ future successes.

The *Curriculum and Evaluation Standards for School Mathematics* (NCTM, 1989) suggested that as the societal needs of the former industrial age are in contrast to the needs of the information age, “the social injustices of past schooling practices can no longer be tolerated” (p. 4). Therefore, it is necessary to have new societal goals for mathematics education, including creating and supporting opportunities for all students to succeed in mathematics (NCTM, 1989). These goals, then, relate to instruction:

[NCTM’s] goals required those responsible for mathematics education to strip mathematics from its traditional notions of exclusion and basic computation and develop it into a dynamic form of an inclusive literacy, particularly given that

mathematics had become a critical filter for full employment and participation within a democratic society. (Stinson, 2004, pp. 10-11)

Mathematics instruction should thus be inclusive, both in who is offered mathematics and how the content is presented. That is, the gatekeeping qualities of mathematics manifest in how certain students are allowed access to mathematics, where access is opportunities to take certain courses, to learn particular mathematics, or to participate in class instruction. Students, characterized as incapable, may be excluded from participating in mathematics and allowed limited access to quality, advanced mathematics. Or, even if access to similar courses is granted to all students, all students in one class may not be offered the opportunity to learn advanced mathematics because of how students are grouped or because of how content is presented (differences in language, culture, or prior knowledge may impact students' access).

*Angela, Mrs. Carlton, and Benjamin (Session 2)*. This vignette (modified from Crockett, 2008; Appendix D) is about a White teacher, Mrs. Carlton; Angela, an intern placed in Mrs. Carlton's class (whose race is not mentioned); and, Benjamin, an African-American student in the class, who was not performing well in mathematics. In the vignette, Mrs. Carlton was exasperated with Benjamin, frustrated with his behavior and also with the pressures she feels in her current context:

From the moment, he walked into her 3<sup>rd</sup>-grade classroom, Mrs. Carlton knew he was trouble. It seemed that he couldn't sit still for more than two minutes, and she often placed him in "time out" for being out of his seat. It bothered Mrs. Carlton that his 2<sup>nd</sup>-grade teacher had not referred him for special education services. Now, she was stuck trying to work him. This was particularly frustrating, since

considerable district pressure was being placed on the teachers to raise test scores.

Mrs. Carlton loved her students and teaching, but the district pressures and her feelings of frustration were becoming hard to manage. Thank goodness for Angela, Mrs. Carlton thought to herself as the last of the students left. (Crockett, 2008, p. 10)

Mrs. Carlton found Angela to be helpful in assisting students with their work and managing student behavior. Angela completed a case study for her university mathematics methods course and learned more about Benjamin, his family, and his capacity to do mathematics outside of the classroom. Although Mrs. Carlton “insist[ed] that Benjamin [was] a low achiever,” Angela learned other information about him from her home visits and case study and wondered about what she should do:

[Angela’s] growing knowledge about Benjamin and his family caused her considerable concern. Benjamin demonstrated mathematical competence in tutoring sessions, on the playground, and at home. Why was he not engaged in Mrs. Carlton’s math lessons? Why did Mrs. Carlton insist that he had limited capacity to learn? She threatened to refer him for special education services. Based on his school records and her observations, she could not see how Mrs. Carlton could justify such a referral. Angela wondered what she should do. (Crockett, 2008, p. 12)

This case included issues of race and class, institutional pressures of accountability, as well as Angela’s positioning as an intern. I chose this case to provide PSTs an opportunity to identify and problematize the multiple social, political, and institutional dynamics that surface in classroom dynamics and the relations between them and the



ways in which Angela's positioning as an intern adds complexity or relates to their own experiences. I wrote discussion prompts to facilitate PSTs in analyzing Angela and Mrs. Carlton's responses and the ways their responses are related to social and political discourses of race and class, and problematizing what they would do if they were in Angela's position.

***Teacher A and Teacher B (Session 3).*** In Session 3, PSTs read two short lesson segment transcripts from Teacher A and Teacher B and short excerpts from interviews with both teachers (modified from de Freitas & Zolkower; Appendix E). In a teacher education course for high school mathematics teachers, de Freitas and Zolkower (2009) used this task to direct prospective teachers' attention to how mathematics teachers position students through their talk. With a similar goal, I modified this task for use in Session 3. In Session 3, participating PSTs read the teachers' interviews and related them to the transcripts from the teachers' classrooms in order to address "the issue of teacher discourse and to what extent lexical density in teacher talk correlates with expectations regarding student achievement" (de Freitas & Zolkower, 2009, p. 197). Interrogating these lesson segment transcripts and interviews provided PSTs with an opportunity to relate teachers' positioning of students in both the transcripts and interviews to the teaching of mathematics, specifically to identify the language teachers are using to position students and investigate how the teachers are being positioned. This example did not detail the students, the school, or the teachers in the manner in which these elements were detailed in the longer, more detailed vignette of Mr. Jones and *Algebra for All*. This activity served to support PSTs in attending to how teachers are positioned, in what ways Teacher A or Teacher B's teaching or interview statements could be in

reaction to the contexts that were positioning them, and what type of contexts positions teachers and students and in what ways. Without the details of the contexts, PSTs would need to articulate distinctions between contexts and not rely on the descriptions when describing how context positions teachers.

In the lesson transcripts, Teacher A provided definitions of the terms range and domain, while Teacher B takes a more casual, conversational approach. Teacher A first wrote the definitions on the board and then continued:

A set of ordered pairs is a function if for a value of  $x$ , there is one and only one value of  $y$ . It is important to say “one and only one”. We cannot have a zero [sic]. There must be a value. For every  $x$ , there must be a value of  $y$ , and there must be only one value of  $y$ . (de Freitas & Zolkower, 2009, p. 196)

This is in contrast to Teacher B who was less specific in his language and addressed his students and the mathematics differently:

What we are going to look at is dealing with graphing names  $x$  and  $y$ , something found in textbooks—words to remember domain, co-domain, [and] range. We are going to look at those words and other words, such as relation and function. Not very important that you know those words, but what they actually do will be the important thing. (de Freitas & Zolkower, 2009, p. 196)

In contrast to Teacher A, Teacher B did not provide the students with explicit definitions of terms and did not emphasize the importance of the vocabulary to the students.

PSTs also read transcripts of interviews with Teacher A and Teacher B. In Teacher A’s interview, he identified how his teaching prepares students for future careers in mathematics and that it is his responsibility to do so:

These kids are going to be mathematicians in the sense that they are going to be able to construct models and draw inferences from them whether it be in business or in a scientific field. That is basically where we have to head with our mathematicians. (de Freitas & Zolkower, 2009, p. 197)

Teacher A addressed issues of access in this interview by emphasizing how his students need to be prepared to be mathematicians. The transcript of his lesson also suggested how he allowed opportunities for students to make inferences, as he mentioned, and provided students with access to the necessary mathematics language.

Teacher B first identified what his students think about mathematics and then discussed the importance of consumer mathematics for his students:

They have an idea “I’m never going to need math in the future because all I want to do is selling or be a check-out girl.” That is fair enough, but they don’t realize that math is important to them making sure that they’re not cheating the customer, or if they are the customer, they’re not cheated. (de Freitas & Zolkower, 2009, p. 197)

Teacher B suggested that his students will be involved with (or said they will be involved with) careers in service, such as a check-out girl.

***Mary Hurley (Session 5).*** PSTs watched a teacher, Mary Hurley, explain her teaching situation in a fourth/fifth grade mathematics classroom in California and read her written narrative (Carnegie Foundation for the Advancement of Teaching, 2006). The full transcript of her video narrative is in Appendix F, and her written narrative is in Appendix G. The goal of Session 5 was to support PSTs in seeing the options for subverting positioning by institutional dynamics of accountability and problematizing

teaching in response. I chose this video narrative specifically to present how one teacher negotiated curriculum pacing with her own understanding of her students and her needs.

The following excerpt is from Mary's video narrative where she discussed her pacing guide, the implications of testing on her students, and her "personal integrity":

I have a pacing guide and this pacing guide is the same for entire district and each year. No matter who the students are: same tests, same pacing guide. The reason that the pacing guide is so onerous is that the district tests the students based on the pacing guide every six weeks, and the results of that test are posted in the school. So not only am I aware of whether I'm behind, and my site administrator, and so are the district and so is the entire community.... How do I go into that curriculum and revise it on a daily, hourly, and minute-by-minute basis to meet the needs of the real kids who are in front of me, um, and at the same time, not completely fall apart, so our school or our classroom becomes a point of contention in the district, that the kids in this classroom are not meeting their benchmark scores in math? So, it's a tricky edge to walk on, making sure somehow I get through that pacing guide and also that I have some personal integrity as a teacher in meeting the needs on my students. (Carnegie Foundation for the Advancement of Teaching, 2006)

Mary identified the struggles with district-mandated curriculum and pacing, the related standardized tests, and the institutional discourses of accountability more broadly. Mary recognized that these issues related to students, how they are positioned as mathematics learners, and her teaching, that is, how she has to support students in learning particular

objectives because of the implications of the standardized tests on her students and herself as a teacher.

***The Wire (Session 6).*** In Session 6, PSTs watched clips from the television drama series, *The Wire* (Zorzi & Hemingway, 2006), which was set in a low-income neighborhood in Baltimore, Maryland. The fictional drama series showcased different facets of the city of Baltimore in different seasons, such as the illegal drug trade and city politics; the fourth season of the series focused on the school system. Specifically, Season 4 portrayed urban schools and how students, teachers, and administrators negotiated the institutional and political systems that influence the schools, as well as the racial and social dynamics.

I presented an episode of this show to give PSTs an opportunity to identify and problematize the intersection of discourses around accountability, race and racism, and urban schooling. In Episode 7 of Season 4, the main plot line<sup>6</sup> centered around a White teacher who sought to connect with his African-American students and engage them in mathematics. He was advised to “stick to the curriculum,” (Zorzi & Hemingway, 2006), but he created a mathematics lesson around gambling and playing with dice in order to teach his African-American students about probability. The episode presented the students as engaged in the lesson and the teacher as satisfied.

This episode served both a snapshot, if not a stereotype, of mathematics classrooms in urban schools and also as a piece of media that presents African-American students as playing dice and a White teacher as “savior,” where a teacher has the power to rescue a student from difficulties and ensure his or her success (e.g., Britzman & Pitt,

---

<sup>6</sup> In *The Wire*, scenes shift between the streets, government offices, and school settings. The focus here is on the main plot line around the school setting.

1996; Robertson, 1997). For example, in the beginning of the episode, the White mathematics teacher, Mr. Pryzbylewski, who the students call Mr. Prez or Mr. Prezbo, introduced his African-American students from the local neighborhood in the mathematics of probability through using games with dice. The following dialogue began with two students playing cards in their mathematics classroom during lunch while Mr. Prez was watching (Full transcript from this episode is in Appendix H):

- Mr. Prez: You know, I said you can't be gambling.
- Kareem: Yo, Mr. Prezbo, the quarters are only, you know, a reminder. You know, that I got 25 shells.
- Michael: Dang, flush.
- Kareem: But it don't beat your three 9's right?
- Michael: Yeah, it do!
- Kareem: It do?
- Mr. Prez: It does. Kareem, you should have been more cautious with your bet. Figure the odds.
- Michael: Yo, it's our lunch break. Don't be schooling us now.
- Kareem: Wow, hold on. Let him talk.
- Mr. Prez: First, you have to get a count on the diamonds. You know how many diamonds there are in the deck?
- Kareem: 13
- Mr. Prez: 13, that's right. Cards are all about knowing the numbers. With the numbers, you can calculate the odds. Now, Michael had 4 diamonds showing-

Michael: Wait, what about dice. I mean, does dice have odds, too? Cause, that's what we play.

Mr. Prez: Dice, sure.

Michael: So, can you show use the odds with dice?

Kareem: Yeah, for real. (Zorzi & Hemingway, 2006)

Mr. Prez was presented as caring about his students and seeking to make mathematics meaningful to them. Later in this episode, Mr. Prez taught the students about odds with dice and told another teacher “trick ‘em into thinking they aren't learning and they do,” emphasizing how he felt that his students were learning mathematics because of how he connected activities with dice to the mathematics they are learning in school. I chose to talk about this episode and the particular clips about Mr. Prez and his teaching because the presentation of Mr. Prez relates to messages about teacher as “savior” (e.g. Richardson, 1997), and the African-American students were positioned as incapable of being engaged in mathematics without a connection to games.

The conversation about *The Wire* served to make it the implicit discourses of accountability and race/racism available to discuss by situating the discourses (and the conversation) in a common artifact. Specifically, the goal of this activity was for PSTs to identity how *The Wire* describes and identifies students and teachers, and not only focus on what the students are doing or what the teacher could do differently. I wanted PSTs to interrogate the manner in which the episode, as a piece of media, was promoting and encouraging perspectives of teachers and students, such as a perspective that African-American students in urban areas do not care about schools or that teachers can make a difference. My discussion prompts, such as “What is this show saying about kids?

About teachers?” were to encourage PSTs to think about prevailing discourses of race, class, and students as mathematics learners and how the media and other mechanisms influences their understanding of themselves, their students, and teaching.

***Revisiting reflections on mathematics teaching and learning (After Session 7).***

After Session 7, I asked PSTs to revisit their reflections on mathematics teaching and learning, an assignment that they first wrote for their mathematics methods course in Fall 2009 (Appendix I). This assignment consisted of two parts:

- Part I: Reflections on your experiences as a math learner. In this part, you will describe your experiences as a math learner and reflect on how those experiences as a learner have shaped your understandings of math, math teaching and math learning. In short, reflect on how your experiences shape what you think and know about math teaching and learning.
- Part II: Reflections on mathematics teaching. In this part, you should describe what you think good math teaching looks like. Use examples and talk explicitly about what good math teaching involves—e.g., the goals and purposes of math teaching, what teachers and students do, the activities involved in math teaching, etc.

This was initially completed before the first course session in Fall 2009.

Towards the end of the semester-long mathematics methods course in Fall 2009, I assigned PSTs to revisit their initial written assignment and note any changes in their understandings about mathematics teaching (Appendix J)<sup>7</sup>. During the seminar, I asked

---

<sup>7</sup> This was completed during the last week of November in 2009 for one section of the course and in the first week of December for students in the other course section.



PSTs to revisit this assignment a third time. The written prompt from Session 7 asked PSTs to:

Revisit your math autobiography and “good math teaching” ideas. During math methods, you added comments to your original ideas about good math teaching that you wrote in September. Now, go back to the one that you wrote in December, and add to, revise, and make comments on *both* the autobiography part and the second part about good math teaching. Use track changes when you add new text and also highlight specific parts and make comments.

I designed this task to support PSTs in connecting our conversations about political and social discourses that frame their understandings of themselves as mathematics teachers and their teaching to their initial and developing thoughts about mathematics teaching, and in response, to evaluate their ideas of teaching practices and propose alternative practices.

### **My Role as Facilitator and Researcher**

I served as session and interview facilitator and researcher. I attempted to avoid pushing my own opinion of particular social, political, and institutional discourses, while also encouraging PSTs to disrupt and question their own understandings of self and our context. Similar with others (e.g., Evans, 2001; Gates, 2011), I see this as a major challenge to this work.

In facilitating sessions, I was mindful to recognize my role and the power dynamics that may “silence the voice of the Other” (Vare, 1995, p. 273). I encouraged PSTs to self-reflect and to commit to learning about issues of dominance and restrictive discourses, but I sought to balance this as a facilitator or dominant voice, proceeding

cautiously because of how the dominant voice has greater power and privilege to arrange space for dialogue. In teacher education, the “dominant voice is that of the professor, and our motives for dialogue come under scrutiny by those who represent the voice of the teacher” (Vare, 1995, p. 273). Across sessions, I encouraged interrogation of dominant discourses, while also seeking to leave the participants space to contest or not contest these issues. This was critical, particularly in Sessions 1 and 2, to establishing open dialogue and a safe environment for PSTs to author their own voices (Cook-Sather, 2002). As PSTs negotiate their multiple identities as student and teacher while they are interning and taking coursework, many PSTs feel that they do not have authority in either the classroom or in coursework (e.g., Jackson, 2001). I was mindful not to take away the authority that they have over their identities through the process of deconstruction and instead sought to support PSTs in understanding their subjectivities and positionings as a means for (re)authoring their own identities (Hill-Collins, 2000). I supported learning as active and social and avoided a model of professional development where “experts” provided teachers with the answers (Webster-Wright, 2009).

Together with the participants, we discussed the research design, implementation, our different roles, and our agendas. In order to support PSTs in sharing their ideas, I sought to provide PSTs with an honest role for their participation and opportunity to author their own perspectives:

To move toward more fully authorizing the perspectives of students is not simply to include them in existing conversations within existing power structures.

Authorizing student perspectives means ensuring that there are legitimate and valued spaces within which students can speak, re-tuning our ears so that we can

hear what they say, and redirecting our actions in response to what we hear. (Cook-Sather, 2002, p. 4)

I sought to negotiate and balance my interests and research agenda with those of the participants, as a way to serve as both a facilitator who responds to their needs and as a researcher who collects and analyzes data on this theory and seminar. However, these tensions that I sought to negotiate are also tensions that I would like to understand, as they will influence implementation of the seminar and application of the theory to teacher education. Working tensions into methodologies “structures methodologies as fertile ground for the production of new practices” (Lather, 2008, p. 228).

I cannot ignore that I am researching the implementation of sessions that *I* designed and facilitated. I am an integral and obvious participant in this research: “That we are inventors of some questions and repressors of others, shapers of the very contexts we study, co-participants in our interviews, interpreters of others’ stories and narrators of our own, is sometimes rendered irrelevant to the texts we publish” (Fine, 1994, p. 14). Although I shared my positions with the participants and detailed the research process with participants and in this dissertation, I do not claim neutrality. I take on the responsibility “to assess critically and continually [my] own, as well as informants’ changing positions” (p. 23). As the participants engaged in activities that I facilitated, this research and analysis is intimately tied to the participants and me. As I engaged in session facilitation and data collection and continue to engage in analysis, I reflected and continue to reflect on my own positioning, its role in PSTs’ responses, how to negotiate

my positioning, and how I position myself in relation to both my research agenda and my responsibilities in preparing PSTs.<sup>8</sup>

### **Delimitations**

There are delimitations that define the boundaries of this inquiry. First, the ElTeach program is an intense 13-month program, and PSTs had many assignments and responsibilities during that time. They were under pressure to complete coursework and engage fully in their internship. Therefore, participation in the study outside of regular coursework needed to be limited to three spring sessions, in order to include as many participants as possible and not overwhelm the already stressed PSTs. This bounded the study because it limited the possible assignments and amount of contact hours with PSTs. Having an all female group, particularly in light of the feminist theoretical premise of the study, may limit the scope of the results.

Seminar sessions and data collection were also completed within a 5-month period, beginning in March and continuing through July. Sessions stretched from early in the Spring semester through the summer Capstone course, but 5 months is a short time frame to see shifts and trends in PSTs' understandings of self and teaching. As the focus of this study is on the theory of performativity and PSTs' responses to the sessions and activities, I collected data across the eight sessions and in final interviews in Summer 2010, but I did not follow PSTs into their first teaching or explore their understandings of self as when they were novice teachers.

### **Data Collection**

Data collection was conducted during each of the seminar sessions and in final interviews with each participant. The first three sessions (Sessions 1 through 3) were

---

<sup>8</sup> I also discuss facilitation in the Implications chapter of this dissertation.

held after PSTs' practicum course, in the library of participating school sites, and with only the participating PSTs. In Sessions 4 through 8, when all ElTeach students take the Capstone course, the small group of participating PSTs met with me during the course in the small-group breakout times, during lunch, and/or after class.

All small group sessions were audio and video recorded; two video cameras and an audio recorder were used. Consistent with design research, this research depends on understanding of the phenomena *while* the process is in progress, and analysis is iterative (Cobb et al., 2003). I watched each video after the session, detailed activities, and began transcribing in order to be responsive to PSTs' needs and to review how data collected related to the theoretical premise and the seminar activities. Initial analysis of PSTs' understandings of being a mathematics teacher and of mathematics teaching, and specifically how they engaged, responded, and participated, more generally, in seminar activities, served to modify subsequent session activities. This iterative process of analysis during the seminar is important for understanding both how performativity and deconstruction relate to mathematics teaching and mathematics teacher education and how the certain actions, activities, and tasks in the seminar are consequential to PSTs and their understandings of being a mathematics teacher and of mathematics teaching. After all data were collected, I completed transcribing each session to create transcripts and as to produce an initial analytical pass identifying important themes (e.g., Corbin & Strauss, 2008). I analyzed data collected from videos and interviews using the data analyses frameworks discussed below.

Data also included PSTs' written responses and reflections. PSTs responded to nine brief writing responses, and these were included in case analysis, using the

analytical tools described below. Through an online course site established for the seminar, PSTs submitted written responses either to a private discussion board or to a drop box. PSTs could not view each other's responses, but I could respond and ask follow-up questions. PSTs' online responses were also included in data analysis.

Individual interviews, completed after PSTs' final portfolio presentations (June and July 2010), provided more data on participants' identities, understandings, and reflections on the process. The interviews were semi-structured to address research questions but also allowed for PSTs to elaborate on issues that they deemed important and for PSTs to engage in continued reflection. Interview protocols were specific to each participant, as I designed specific questions to follow up on written assignments and particular moments of interest during the seminar. I used a stimulated recall interview format which included viewing and discussing selected video clips from the seminar; this format stimulated PSTs' reflection on the experience in the seminar and discussion about their responses. I asked specific questions as clarification of their responses, and I also listened for changes in how they were responding in the interview as compared to an early session, for example. We also reviewed their written assignments and seminar transcripts. A representative sample of an interview protocol is in Appendix K. As facilitator and researcher, I do not assume that I am a neutral, unbiased, or invisible participant in the interview. I consider the interview a negotiated text between the participant and me, and I was reflexive about the process, my role, and my influence on it (Fontana & Frey, 2008). The interview is but one element of the data corpus that provided data on PSTs' ideas and reflections.

## Data Analyses

**Operationalizing poststructural feminism.** Poststructural feminism undergirds the theoretical framework of this study; I used it as a lens in order to make sense of the complexity of PTS' understandings of themselves and how these self-understandings are constructed. Using this lens to *analyze* PSTs' self-understandings, which relates to what the research literature calls identity, however, required operationalizing poststructural feminism. Embracing an analytical framework was necessary, despite how poststructuralism contests categorizing and structures: "It is important to understand, however, that poststructuralism cannot escape humanism since, as a response to humanism, it must be implicated in the problematic it addresses" (St. Pierre, 2000, p. 479).

Similar to researchers who align with poststructural feminism (e.g., Butler, 1999; St. Pierre, 2000), in this study, I define *discourses* as powers, norms, and social and political forces and not simply words or language. In the discussions of discourses in this study, individuals are actors in situations that have been structured by these forces. I contend that there can be individual agency in local social action, while maintaining an awareness of these processes and influences on structure: "The local social actor is not simply an automaton. Even in the absence of 'full discursive awareness,' the local social actor attempts to realize certain purposes rather than others" (Erickson, 2004, p. 158). In this way, individuals have agency in their talk. Therefore, in studying PSTs' interactions with session material and their discussions of themselves and their practice, discourse analysis is the primary analytic approach to bring together macro- and micro-level accounts (Erickson, 2004). I focused this analysis on PSTs' talk and text in order to

understand individuals' understandings of themselves as mathematics teachers, their interactions and engagements, and their take up of new understandings of themselves and teaching.

Operationalizing a poststructural feminist conception of identity also requires analytical tools that are rigorous and sensitive enough to capture how identities are fragmented, contradictory, and complicated and also dependent on and formed within contexts and relationships. Following other researchers who seek to operationalize poststructural feminism in mathematics education (e.g., de Freitas, 2008; Walshaw, 2010), this analysis begins with PSTs' own struggles and tensions as emergent in their talk and text. In this study and in representative studies about PSTs (Britzman, 1991; Jackson, 2005), PSTs' own struggles and tensions surface in their talk and text and emerge as contradictions or inconsistencies. Because there are many elements of a PSTs' self-understanding, what may sound like a lack of internal consistency is part of the complexity of identity and of PSTs' understandings of self as mathematics teacher, in particular.

Capturing this in analysis necessitates a researcher's attention to the discursive *processes* around these struggles and tensions and not a singular focus on the contradictions between spoken words. That is, to emphasize PSTs' discursive processes and how they are *developing* understandings of self as mathematics teacher, analysis must "resist the construction of categories which abstract talk from its conversational context" (MacLure, 1993, p. 314) or simplify PSTs' identity work in a manner that strips identity work itself of its inherent complexity. The operationalization of performativity I have undertaken for this analysis and its focus on positioning (Davies & Harre, 1990,



Ellsworth & Miller, 1996, Mauthner & Doucet, 2003) and problematizing (Horn & Little, 2010) bounds what I can and cannot identify in my analysis. While useful in order to analyze PSTs' self-understandings, a focus on positioning and problematizing turns the focus away from other constructs that could potentially explain how PSTs discuss themselves or their teaching (e.g., teacher as role, teacher beliefs, dispositions). This, as noted above, is the complexity with operationalizing poststructural feminism, where systems and categories are to be contested (St. Pierre, 2000).

**Research questions and overview.** Using discourse analysis in four case studies, this study investigated how PSTs are developing understandings of themselves as mathematics *teachers* and *teaching* in context. The following research questions guided this study. For PSTs participating in a seminar on critical self-reflection and mathematics teaching in context:

- How are they understanding themselves as *mathematics teachers*? How are these understandings shifting?
- How are they understanding *mathematics teaching* in context? How are these understandings shifting?

In this analysis, I distinguished between and used different analytical tools to investigate PSTs' understandings of self as mathematics *teacher* and PSTs' understandings of *teaching*. In this section, I detail the analytical tools used for each research question. Figures 2 and 3 both include details of how PSTs' understandings of self as mathematics teacher and of teaching are conceptualized and analyzed in this study. Figures 2 and 3 both illustrate the relations between the research questions, analysis, and seminar objectives but represent these relations differently in order to serve different purposes.

<p>Research Question 1: For PSTs participating in a seminar on critical self-examination of self as mathematics teacher and teaching, <u>how are they understanding themselves as mathematics teachers?</u> How are these understandings shifting?</p>	<ul style="list-style-type: none"> <li>•Understanding of self as mathematics teacher defined as positioning (Davie &amp; Harre, 1990) and being <i>reflexive</i> about positioning (Mauthner &amp; Doucet, 2003)</li> <li>•Analyzed as the particular discursive practices of <i>working difference</i> (Ellsworth &amp; Miller, 1996): positioning as contextualized, as relational, and in performance</li> </ul>	<p>A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations</p> <p>B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers</p> <p>C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher</p>
<p>Research Question 2: For PSTs participating in a seminar on critical self-examination of self as mathematics teacher and teaching, <u>how are they understanding mathematics teaching?</u> How are these understandings shifting?</p>	<ul style="list-style-type: none"> <li>•Shifting understandings defined as repositioning</li> <li>•Analyzed as repositioning as a discursive practice of <i>working difference</i> (Ellsworth &amp; Miller, 1996)</li> </ul>	<p>C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher</p> <p>D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching</p>

Figure 2. Research questions and related analytical methods and seminar objectives

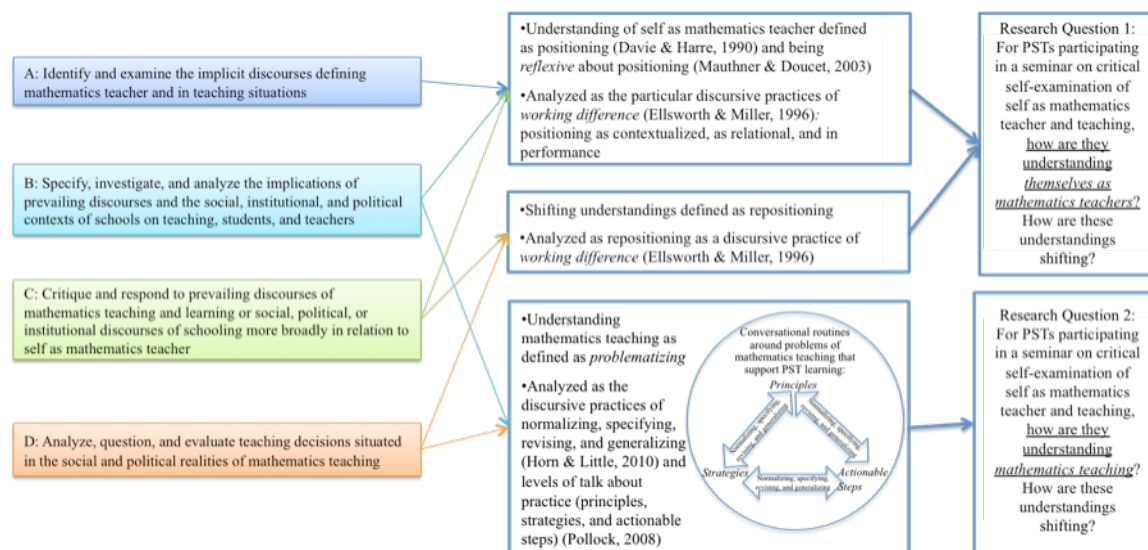


Figure 3. Objectives and related analytical tools and research questions

Figure 2 illustrates how the analytical tools and seminar objectives relate to each research question. It focuses on the analytical tools and objectives that I used to answer each research question and how I answered each research question. Figure 3 illustrates the structure of my analysis, emphasizing which analytical tools I used to analyze PSTs' responses to which objective, similar to how design-based research reifies each conjecture in particular tools (e.g., Sandoval, 2004). It follows how I framed my analysis by each objective and how the analysis by objective flows into the research questions.

**Case study as method.** I used case study research method because of the goals of this study to understand *how* PSTs are developing their understandings and *how* they are shifting and these questions are situated within the complexity of the seminar. A case study is an “empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003, p. 18). A case study was appropriate for this dissertation because of my attention to the real-life context, the seminar, as well as the participating PSTs as individuals. I chose a multiple-case design in order to present the different and various ways PSTs' self-understandings and their understandings of teaching shifted; the included cases are neither typical nor unique but rather they present the different ways PSTs shifted and provide the variation needed for analysis across cases.

In each case, organized by participant, I addressed how PSTs are understanding themselves as mathematics teachers and teaching in contexts and how these understandings are shifting by analyzing how PSTs are being reflexive about their positioning, how PSTs are repositioning themselves, and how PSTs are problematizing

mathematics teaching, around the four objectives from the seminar (Seminar objectives are listed on pp. 72-73). To develop each case, I analyzed all sessions and each PST's written work around an issue that emerged as salient for each PST using the discourse analysis frameworks presented below. I used the four objectives of the seminar to frame my analysis, similar to how design-based research embodies conjectures about learning within educational designs (e.g., Sandoval, 2004). Using the seminar objectives to organize analysis allowed me to understand how participants' response and interactions differ across and within objectives and more broadly clarify purposes and document shifting understandings (e.g., Cobb, Stephan, McClain, & Gravemeijer, 2001). In each case, I presented analytic episodes that corresponded with the objective and that were representative of the ways in which a PST demonstrated or did not demonstrate an objective around the issue that emerged as salient to each PST. The relations between the analyses of each PST's engagement in positioning and problematizing teaching serve to support the primary research question about PSTs' understandings of self as mathematics teachers and teaching in context and how those understandings shift.

This study also explored the seminar itself and how it supported PSTs' critical examination of themselves as mathematics teachers. To discuss the seminar itself, I used the relations between the analyses *across* cases to explore how the seminar supports PSTs' critical self-examination, both their understandings of being a mathematics teacher and teaching and the shifting of those understandings.

**Being reflexive about positioning and repositioning.** I conceptualized PSTs' understandings of being a mathematics teacher as positioning (Davies & Harre, 1990) because how PSTs are positioned and how they position themselves is a central aspect of

their relationship to mathematics teaching and learning. Positioning is how discursive practices constitute speakers and hearers in certain ways and also serve as a resource through which speakers and hearers can negotiate new positions (Davies & Harre, 1990). Positioning is interactive but not necessarily intentional, although there is potential for one to be reflexive about his or her positioning.

This analysis focused on how PSTs were *developing* understandings of themselves as mathematics teachers or being reflexive of their positioning in social interaction. Being reflexive about positioning means recognizing one's positioning and the circular nature of positioning in social structure (Mauthner & Doucet, 2003). Positional knowing "operates by critiquing the relationships between particular stories and broader interpretive frameworks.... Position more than any other single factor influences the construction of knowledge" (Maher & Tetreault, 1994 in Martin & Van Guten, 2002, p. 48).

*Working difference* (Ellsworth & Miller, 1996) is this process of positional knowing, specifically, the process of being reflexive about positioning and the related social and political discourses. I analyzed PSTs developing understandings of mathematics teacher and the related social and political discourses using the discursive practices of working difference. Working difference foregrounds "the work of configuring and reconfiguring the boundaries and meanings of difference over time and within particular historical contexts" (Ellsworth & Miller, 1996, p. 249). Working difference does not mean working *through* differences, rather it suggests a "constant kneading of categories and separations," where the process of kneading, similar to the kneading of bread, starts a process of transforming separate elements "into something

that gives those elements new meanings and uses,” (p. 246). In this manner, working difference “is a continual motion that keeps breaking down the unitary aspect of each new paradigm of difference” (p. 246). Working difference as a process operationalizes the socially constructed nature of identities and *performativity* (Butler, 1999). While Ellsworth & Miller’s definition of “working difference” provided a description of the process of being reflexive about positioning, further specification was required to *analyze* how PSTs in this study work difference. Based on close reading of the empirical literature using the notion of working difference together with emergent categories from my own analysis, I identified four discursive practices that constitute aspects of the process of working difference and the recognizing of one’s positioning and the circular nature of positioning in social structure (see Appendix L)<sup>9</sup>.

Analytically, working difference is identifying, specifying, and responding to *positioning as contextualized*, *positioning as relational*, *positioning in performance*, and *repositioning*. Each of these discursive practices is described below and outlined in Table 2. Discursive moves around *positioning as contextualized* include when the PST identifies, specifies, or otherwise attends to social, political, historical, or institutional contexts and how they relate to positioning by a particular discourse or in a particular manner. *Positioning as relational* includes when the PST attends to positioning as in relation to others or gives explicit attention to the multiplicity of positioning and the constant process of and opportunities for negotiating positioning and membership in different groups. Discursive moves related to *positioning as performance* concern the ways in which a PST identifies, specifies, or responds to one’s own or other’s actions as

---

<sup>9</sup> In Appendix L, I detail the four discursive practices of working difference and how they emerge in Ellsworth and Miller (1996), Williams (1991), and Ellsworth and Miller’s analysis of Williams (1991).

*Table 2. Discursive practices of being reflexive about positioning and repositioning*

Discursive Practice	Description
Positioning as contextualized	Identifying, specifying, or attending to social, political, historical, or institutional contexts and how they relate to positioning by a particular discourse or in a particular manner
Positioning as relational	Identifying, specifying, or explaining positioning as in relation to others or gives explicit attention to the multiplicity of positioning and the constant process of and opportunities for negotiating positioning and membership in different groups
Positioning in performance	Identifying, specifying, attending, or responding to one's own or other's actions as suggesting positioning by a particular discourse
Repositioning	Identifying, specifying, or explaining the actions that one has to take in order to subvert or contest a particular discourse or the <i>possibilities</i> for repositioning

suggesting positioning by a particular discourse. In my analysis of PSTs, these three discursive practices suggests how PSTs are reflexive about their positioning, that is, understanding themselves as mathematics teachers.

Attending to *repositioning* means identifying, specifying, or explaining the actions that one has to take in order to subvert or contest a particular discourse. These actions—and in my analysis, also the identifying and specifying of the *possibilities* for repositioning—suggest repositioning or shifting understandings of self. Butler (1999) emphasizes both acts of subverting positioning and “thinking through the *possibility* of subverting and displacing” (p. 46) for “intervention and resignification” (p. 45) of identities or, in this analysis, shifting understandings of self as mathematics teacher. Repositioning as theorized for my analytical purposes is not directional or analyzed as movement in a particular direction, either towards or away from a particular discourse; analytically, repositioning is creating a more articulated position and there is not a normative response to the direction. For example, repositioning in relation to a discourse of test-based accountability does not include being in favor of or not in favor of testing;

rather, it includes specifying one's relations to the particular discourse or position, explaining details and actions in relation to the discourse, and describing personal actions one can take in relation to the discourse, perhaps identifying subversive behaviors or the way one is positioned.

My analysis followed how each PST engages in the discursive practices of working difference in relation to a particular discourse that emerged as salient for each PST and that can be conceptualized as central to her understanding of self as mathematics teacher. The emergent discourse served as a theme for the analysis of each PST. Across the data corpus, I analyzed how PSTs engage in identifying, specifying, and responding to positioning as *contextualized*, *as relational*, and in *performance* around this theme (and only around this theme) to explore PSTs developing understandings of themselves as a mathematics teacher and the discourses that shape those understandings. PSTs' *repositioning* served to support analysis of whether and how PSTs understandings of being a mathematics teacher are shifting.

**Problematizing mathematics teaching.** I conceptualized PSTs' understandings of mathematics teaching in terms of how they problematize mathematics teaching. Across the data corpus, I analyzed how PSTs problematize their mathematics teaching or the teaching of others or in other ways recognize the conditions, complexity, or implications of teaching decisions through how a participant talks about her lessons and teaching and the meaning that she or he gives to teaching decisions and enactments. PSTs' talk about teaching can be evidence of their problematizing: "In whatever ways relevant knowledge and spaces for teacher learning are evident in the practice, one should be able to see and hear them in some way" (Little, 2002, p. 920). Horn and Little (2010)



suggested that conversations that are potentially conducive to professional learning contain dialogue that “did more than report on or point to problems of practice, or brainstorm quick advice, but supplied specific means for defining, elaborating, and reconceptualizing the problems that teachers encountered and for exposing or building principles of practice” (p. 190). That is, the particular discursive moves around teacher talk are important. This focus on PSTs’ discursive practices meant “listening for the dynamic in the student’s response” (Britzman & Pitt, 1996, p. 123) and how they were responding, not only focusing on the exact discourse or interpretation. In examining how PSTs were understanding mathematics teaching, I analyzed shifts in PSTs’ discursive practices, and PSTs were not expected to embrace a certain enactment in their teaching (e.g., Britzman & Pitt, 1996).

I identified “problems of practice” (Horn & Little, 2010) through PSTs’ discursive practices that suggest that classroom interactions, either hypothetical or real, were experienced as “troublesome, challenging, confusing, recurrent, unexpectedly interesting or otherwise worthy of comment” (p. 189). A cue to a problem of practice may be a PST’s specific reference to trouble, an expression of concern or distress, or a direct appeal for assistance (Horn & Little, 2010). I analyzed how PSTs discuss and take up expressed problems, either as a group or individually, using the particular conversational moves of *normalizing* a problem of practice, further *specifying* the problem, *revising* the account of the problem (its nature and possible causes), and *generalizing* to principles of teaching (Horn & Little, 2010). Each of these four discursive practices is described below and outlined in Table 3.

Table 3. *Discursive practices of problematizing mathematics teaching*

Discursive practice	Description
Normalizing	Talk that supplies reassurance or establishes solidarity; normalizing turns talk towards teaching when, for example, the problem poser is given agency in describing the problem or when the speaker treats the problem as a starting point for further discussion; normalizing practices that turn talk away from teaching are when the speaker offers categorical advice or dismisses the problem
Specifying	When the problem-poser provides more details or another speaker elicits more details. The process of specifying focuses attention to details, provokes conjectures by the problem poser and others, and supports the speaker's agency and opportunities for revisions, clarification, and reformulation
Linking	Talk where the speaker makes comparisons and connections between situations and uses resources including talk and representations to articulate and show other participants the basis of the comparison
Generalizing	Talk that moves between practices and principles, suggesting principles or a framework of practice

*Normalizing* moves include talk that “supplies reassurance (‘you’ll be fine, don’t worry’) or establishes solidarity (‘it happens to all of us’)” (Horn & Little, 2010, p. 192). These discursive moves, in combination with other moves, function to turn the conversation “*toward* the teaching or *away from* the teaching as object of collective attention” (p. 192). Normalizing moves that turn towards teaching are when a PST or PSTs treat the problem as a starting point for more discussion and as a means to “anchor emergent advice” (p. 192). Normalizing moves that turn talk away from teaching and towards either “familiar aphorisms” or other tasks tend to “obscure any relationship between specific instances of trouble or surprise and endemic dilemmas of teaching (a class of problems)” (p. 192). In these moments, the problem poser is positioned “as relatively helpless in the face of circumstances beyond his or her control or as a passive recipient of others’ advice” (p.

192). In contrast, normalizing moves that turn talk towards teaching serve as a discursive practice that suggest problematizing.

After a problem is taken up, problematizing practice involves *specifying*. Specifying is when the problem-poser provides more details or another speaker elicits more details. As other participants ask the speaker questions and elicit additional information, they communicate “the inherent complexity and ambiguity of teaching while supplying themselves with the specifics needed to introduce and evaluate multiple explanations for the problems that surface” (Horn & Little, 2010, p. 202). The process of specifying focuses attention to details, provokes conjectures by the problem poser and others, and supports the speaker’s agency and opportunities for revisions, clarification, and reformulation (Horn & Little, 2010). This process of specifying, however, can also lead back to normalizing as an end point if the PST does not remain agentic or is positioned as not having control of the situation. Specifying, as evidence of problematizing, supports PST agency when responses position the PST in control of his or her teaching..

The discursive practices of *linking* and *generalizing* also illustrate problematizing. Linking involves comparing and making connections between situations: “Through linking, a speaker proposes a comparison between situations and uses resources including talk and representations to articulate and show other participants the basis of the comparison” (Jurow, 2004, as cited in Horn & Little, 2010, p. 197). Sharing positive or negative classroom experiences without the practices of linking and generalizing, however, may become a “gripe session” and may not be generative of learning (Horn & Little, 2010). Similarly, if the conversation moves straight to advice or general

principles, then the individual PST may not be supported in connecting her experience with the principles of teaching or more general ideas of teaching. Linking and generalizing, or the movement between principles and practice, suggests that the PSTs are constructing “general frameworks for thinking about teaching problems, providing durable tools for their work” (Horn & Little, 2010, p. 202).

Horn and Little (2010) identified different types of principles of practice, such as principles of teaching response, principles of interpretation, and principles of learning in, from, and for teaching. During these sessions, and across the analysis, different principles of emerged, particularly principles of teaching response and principles of interpreting student behavior or student understanding. In analysis, I identified and named emergent principles in order to refer to them within and across cases. Principles are numbered in the order they appear.

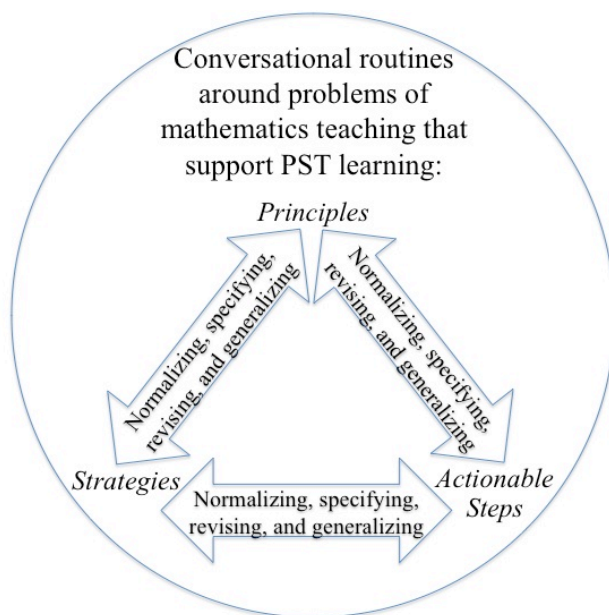
Similar to Horn and Little’s (2010) suggestion of the generative potential of teacher talk, Pollock (2008) emphasized that conversations about teaching, teacher practice, or problems of practice, particularly problems of practice about issues of race and class in schools, should occur on multiple *levels* in order to build connections between the theoretical or abstract responses and concrete practices. Where Horn and Little emphasized conversational moves and analytical tools for understanding teacher talk, Pollock created a framework for teacher educators and teachers to use encourage participating teachers and teacher educators to identify and discuss different levels of talk. She labeled these as the levels of principles, strategies, and “do tomorrows” or actionable steps:

- Principle: “a core idea about how to pursue racially equal opportunity and counteract racism from within schools and classrooms” (Pollock, 2008, p. xx)
- Strategies: “General actions that seem compelling or not compelling for classroom use” (Pollock et al., 2010, p. 216).
- “Do tomorrows” or actionable steps: “Specific solutions that seem to hold potential for a specific classroom or school at a given time, depending on the local setting and its specific personalities and dynamics” (Pollock et al., 2010, p. 216).

Pollock (2008) emphasized that teacher talk about issues of race and racism in school should cross all levels. How PSTs engage in the discursive moves of *normalizing* a problem of practice, further *specifying* the problem, *revising* the account of the problem (its nature and possible causes), and *generalizing* to principles of teaching *across* Pollock’s levels suggests problematizing of mathematics teaching, as presented in Figure 4.

Problematizing of practice—and shifting of understandings of mathematics teaching—is in the interplay between these levels and the interplay between these discursive practices. Horn and Little (201) explain how the interplay is important:

If teachers had shared only their own experiences of “mayhem” with Alice, the conversation could have developed into little more than a gripe session, perhaps emotionally cathartic, but nor necessarily generative for the teachers’ learning about how to handle mayhem in the future. On the other hand, if teacher had moved directly to categorical advice (when this happens, do this) or only general principles of teaching had been shared, unattached to specific examples, the work



*Figure 4. Conversational routines that suggest problematizing of mathematics teaching*

of applying these principles to actual practice would have remained opaque, left to the individual teacher to sort out. Instead, by moving between the particular and the general, the teachers conversationally constructed general frameworks for thinking about teaching problems, providing durable tools for their work. (p. 202)

This work of “recontextualizing generic teaching principles or unspecified images of classroom practice” (Horn & Little, 2010, p. 202) is an important element of teacher learning, and coupling principles with both strategies and examples can create resources for teachers to use to think through future problems (Horn & Little, 2010). The movement between and the attention to the discursive practices of specifying, revising, and generalizing and to Pollock’s levels of actionable steps, strategies, and principles can support teachers in defining and explaining a common teaching problem and principles for responding to it.

Figure 4 also represents how Pollock's (2008) three levels of talk serve to structure the analysis of the content of the conversation, while attention the discursive practices of normalizing, specifying, revising, and generalizing (Horn & Little, 2010) are the processes of the conversation that the analysis follows. Problematizing teaching includes how PSTs are negotiating three specific levels of attention—attention to core principles of teaching, strategies for instruction, and actionable steps specifically for tomorrow's classroom (Pollock, 2008)—and using particular conversational routines that open up opportunities for learning about practice (Horn & Little, 2010).

Participating PSTs engaged in similar conversational moves to the teachers in Horn and Little (2010), but they used our seminar as a space for problematizing these various elements of the work of teaching and not specific classroom interactions. PSTs in this analysis self-identified as interns—that is, not the lead teacher—and as (education) students, which may relate to how they did not discuss specific classroom problems as readily. In other terms, the model of domain learning (Alexander, 2003) suggest PSTs are in acclimation, not in competence or expertise, where PSTs may have fragmented knowledge about teaching or teaching remains a “complex, unfamiliar domain” (p. 11). In contrast, in-service teachers, such as in Horn and Little (2010), have more expertise to draw upon in order to offer each other suggestions to address each others' problems. The participating PSTs in this study may have had the capacity for problematizing as a discursive practice, but they may not have had the actual classroom experiences that may be necessary in order to offer each other the same type of advice. The contextual elements of the course and how those influenced PSTs also may explain why PSTs were not focusing their conversations on specific classroom interactions. The focus of our

seminar group and the Capstone course, more generally, was on self as teacher, and the space was not framed as looking at future classroom practices. Therefore, conversations began with thinking about what it meant to be a teacher, the broad terrain of teaching problems and tasks, and not particular classroom interactions. Similarly, PSTs were focused on completing their coursework and the required portfolio, which was about their entire teaching experience and required attention to many different elements of the work of teaching.

I also modified the Horn and Little (2010) framework because of my specific focus on understanding how an *individual* is problematizing teaching or taking up new understandings of mathematics teaching. Horn and Little (2010) used this framework of problematizing to analyze differences in group discourse in terms of the collective orientation and contextual resources and constraints of different groups. Horn and Little examined how teachers' conversational routines "enhanced or limited opportunities for in-depth examination of problems of practice and hence shaped teacher learning" (p. 183). While Horn and Little (2010) explicitly did not foreground the individual, this study and its analysis focused on how individual PSTs engaged in discursive practices of problematizing and how this suggested how the individual was taking up new understandings of mathematics teaching. Using Pollock's (2008) levels focused analysis on the content of the conversation and on how an individual PST engaged in the interplay across levels of content and different discursive practices. To understand PSTs' taking up of new understandings of mathematics teaching, this analysis used Pollock's (2008) levels to structure the content of the conversation and followed the processes of the conversation using the discursive practices of Horn and Little (2010).



## Overview of Following Chapters

Chapters 4, 5, 6, and 7 present the analyses of the four focal cases. Each of the case chapters begins with a sketch of the participating PST. The sketch is meant to help the reader to begin to know each PST in ways that support the reading of each case; the case then presents a more dynamic picture of each participating PST and her understandings of herself as a mathematics teacher and of her teaching. The analysis of each case followed the four objectives and included unique and representative analytic episodes that present the ways in which PSTs were engaging in understanding themselves as mathematics teachers and their teaching in relation to an issue that emerged as salient. I used the analytical tools as outlined above in line-by-line analysis of transcript to examine how each PST was reflexive about her positioning, how she repositioned herself, and how she problematized mathematics teaching. In the interest of presenting manageable amounts of data, I only present small excerpts of data in each case chapter, excerpts that relate to each objective and that are representative of PST's discursive participation. Some analytic episodes in one case may be the same as episodes analyzed in another case; for example, each case includes analysis of the focal PST's responses to the discussion of Teacher A and Teacher B in Session 3. The *analysis* of this episode and other episodes that are in multiple cases, however, is different across cases because I used each focal case as a filter through which to analyze the data. Each case ends with an overview and discussion.

I chose the four PSTs, identified as Candice, Brooke, Sarah, and Laura (and discussed in Chapters 4, 5, 6, and 7, respectively), for case analysis because of the different ways in which they understood themselves as mathematics teachers and

teaching in context and how those understandings shifted. I chose Candice because of how she worked explicitly to interrogate and examine discourses of race and class in her classroom and across school contexts. Across the seminar, Candice repositioned herself as a mathematics teacher and engaged in problematizing practice with increasing frequency in relation to these discourses. Brooke was chosen because of the manner in which she focused on her own classroom context and its particularities to the exclusion of attending to prevailing political and social discourses and how they surfaced in her classroom and positioned her as mathematics teacher. Analysis of her case did not reveal evidence of repositioning or problematizing of mathematics teaching. Sarah discussed many of her own struggles and tensions in her teaching and in understanding herself as a mathematics teacher, particularly how to understand herself in relation to her test-driven school context and how accountability pressures positioned teachers and defined their teaching. Sarah demonstrated shifts in her understanding of herself and her teaching across the seminar sessions in relation to these tensions. I chose her for this analysis because the ways in which she discussed and problematized these tensions and positioned herself as agentic. Laura also identified prevailing discourses of student abilities that surface in classrooms and discussed how institutional constraints and accountability pressures influence teachers in various ways. She was reflexive about her positioning and the many ways teachers are positioned, problematized teaching in a principled manner, and identified a limited number of ways to reposition herself in relation to deficit perspectives of students. In contrast to Candice, however, there was not a single, strongly emergent theme across the case of Laura; rather, this case is significant because of the ways in which Laura identified many tensions in her practice and self-

understanding and did not suggest that she was agentic in addressing these tensions in her teaching.

In Chapter 8, I revisit my research questions and discuss the research questions across the cases. Chapter 9 details the implications of this study for understanding the theoretical premise of deconstruction and for preservice mathematics teacher education more specifically and includes a final conclusion.

## **Chapter 4: Candice**

Candice is in her late twenties, and she self-identifies as an African-American female. She moved from Los Angeles specifically to attend the ElCert program because of its geographic proximity to areas that she felt were rich with African-American history. Candice had previous experience working with students in alternative schools and with programs for students who are at risk for educational failure. In our mathematics methods course in Fall 2009, Candice described her experiences as a mathematics learner and how they related to her mathematics teachers: “Math is not hard. Many people, like myself, have not had many great teachers of mathematics, because many math teachers did not have great teachers and the cycle continues.” In her interview and other informal interactions, Candice emphasized the importance of her family and how they supported her continued studies and her goals of working with children.

Candice was placed at an elementary school in Graverly County for her internship. Her placement school required her to rotate through three different classrooms during her internship. Therefore, unlike other PSTs in the program, Candice had four different mentor teachers during her internship and experiences in three grade levels, specifically in first-, third-, and fourth-grade classrooms. Her school also required her to continue in her internship until the end of the school year, making her internship five weeks longer than other PSTs’ internships and overlapping with the Capstone course. While Candice attended all sessions and engaged in activities during the seminar, she completed only five of nine written assignments and mentioned how she was overwhelmed with her workload during the Capstone course and her internship.

Candice was the only African-American participating in our seminar. During our seminar sessions, she actively listened to others, turning her head towards the speaker. She rarely interrupted others and did not involve herself in other activities, such as emailing or texting, while others were talking. She has a deep and hearty laugh, but she was generally reserved during our sessions. More than other PSTs, her comments and questions responded and connected to another participant's comment, suggesting her active listening, reflecting, and a high degree of engagement in the sessions.

### **Analysis of Candice Across Seminar Objectives**

This analysis, structured by the four seminar objectives, presents how Candice's understandings of herself as a mathematics teacher and her mathematics teaching are situated in racialized contexts, in contexts that make distinctions based on social or economic class, and in the complexity of social interaction. Table 4 is a map of the presentation of the case in order to help the reader follow the episodes that are aligned with each objective.

Across the seminar sessions, Candice examined issues of race and class and how they influence teachers, students, and school contexts. She was reflexive about her positioning and repositioned herself in relation to these issues by specifying how to negotiate these issues and respond in a manner consistent with a principle of everyday antiracism in education. Candice used race and class as lenses through which to understand school contexts and teachers' responses. With increasing frequency across sessions, Candice also problematized teaching in a principled manner, specifying how these issues related to her teaching context and test-based accountability pressures. The following principles of practice emerged in the analysis of Candice across sessions:

*Table 4. Presentation of the case of Candice by objective and analytic sections.*

Objective A	Objective B	Objective C	Objective D
Identifying everyday racism by teachers, in schools, and across contexts (Sessions 1 and 6)	Examining institutional pressures, social contexts, and the relations between them (Sessions 1 and 2 and Vision statement)	Critiquing mathematics teaching and relating mathematical vocabulary and access to mathematics (Session 3)	Problematizing student responsibilities and teacher expectations as related to students' contexts and access to opportunities to learn (Session 4)
Enacting a principle of everyday antiracism in education (Sessions 1 and 2)	Responding to problems of practice and engaging in discursive practices that move the conversation away from problems of practice (Session 2)	Distinguishing between how teachers are positioned and how teachers engage with students (Session 3)	Critiquing and problematizing grading practices in high-stakes accountability contexts (Session 4)
		Specifying the influence of the hidden curriculum and describing teachers as repositioning themselves and their students (Session 3)	Problematizing evaluating and reporting student progress (Session 4)
			Analyzing supporting student learning and self-concept (Portfolio presentation)

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx).

- *Principle 2, Interpreting and understanding students:* Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning.
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.

Candice detailed practices in relation to and across these principles, and the analysis reveals how her understandings of herself and her teaching shifted across objectives and over the sessions.

**Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations.** In this section, I focus on how Candice examined and interrogated the implicit discourses defining mathematics teacher and in teaching situations in Sessions 1, 2, and 6. In these sessions, Candice identified the discourses of racism and classism and the ways in which how she and others are positioned in relation to these discourses. Across the episodes that I present in this analysis below, Candice demonstrated this objective through the manner in which she was reflexive about her positioning, particularly her attention to positioning as contextual, as relational, and in performance.

***Identifying everyday racism by teachers, in schools, and across contexts (Sessions 1 and 6).*** In Session 1, PSTs read a vignette about teachers' negative reactions to a new state mandate that all 8<sup>th</sup>-grade students take Algebra 1 (Appendix C). I chose this vignette to provoke consideration of prevailing school discourses of mathematics as a process of following procedures and memorizing rules; the politicized nature of mathematics or mathematics role as "critical filter" (NCTM, 1989); institutional

discourses of accountability, such as curriculum mandates; and social discourses of low expectations of particular groups of students (Detailed rationale for this activity in discussed in Chapter 3).

Teachers in the vignette suggested that some students would struggle with the “higher-level thinking” or did not need Algebra 1. Mr. Jones, a teacher in the vignette, said that making all students take Algebra 1 will be “harmful to their self-esteem,” and as some students are “never going to use it,” it is “unfair” to make them take Algebra 1. Candice sought to explain how and in what ways Mr. Jones was concerned about his students:

It seems like he's concerned that they're not cognitively capable. And he doesn't believe that they can learn. He, his concern is coming from a place, where, he's worried about the students. He is worried about the students, but his, his, thinking is definitely skewed, and it's just kind of, like, off. But he does seem genuinely concerned, but he doesn't believe that every child can learn. (group discussion, March 23, 2010).

Candice identified that Mr. Jones cared about his students and was concerned about his students’ abilities, but she described his concern as rooted in his lack of confidence in his students’ abilities to learn. She emphasized the importance of believing that all students can learn and how Mr. Jones’ concerns, even if well-meaning, did not align with this idea. Candice suggested that Mr. Jones’ negative ideas about his students were “coming from a place” but she did not specify what this meant. In this manner, she identified teachers’ words and actions as situated in contexts and as related to outside influences or previous experiences.



The conversation shifted to Mrs. Johnson, another teacher in the vignette, and back to Mr. Jones, when Sarah made a comment.<sup>10</sup> Sarah's comment regarding Mr. Jones opened a space for Candice to describe more about the idea that she introduced earlier. Sarah introduced the phrase "soft bigotry of lowered expectations" and clarified what it meant to her and how it related to Mr. Jones:

Sarah: Does anyone know, has anyone ever heard the expression, like soft bigotry of lowered expectations? That's what that makes me think of.

Maya: Yes

Jill: Soft—

Sarah: [one laugh] soft bigotry of lowered expectations.

Jill: I like that.

Sarah: I know. I read it some place: soft bigotry of lowered expectations. When I read his comment, that's exactly what I thought. That's an example of it.

Jill: Okay, tell us more, because he

Sarah: It's to have such a low opinion of your students. That's bigotry and dehumanizing, and I find it really offensive.

Jill: Even though he's trying to be nice?

Sarah: He's not.

Candice: But that's because, he doesn't—that's why it's soft.

---

<sup>10</sup> During most of Session 1, group conversation moved between several issues, including, for example, what Mr. Jones is teaching, how elementary mathematics neglects breadth for depth, and PSTs' own experiences with the recently completed state testing. As a new type of course experience, PSTs may have been searching to define appropriate responses during the seminar. The conversation was less focused in this first meeting as compared to later sessions.

- Josephina: He doesn't realize.
- Jill: Okay, that's why it's soft because he doesn't realize?
- Susan: It's that, yet, I think-
- Candice: He's not being malicious or anything.
- Sarah: I guess, I guess it's, kind of, is at that unconscious level. But I kind of feel like he should know better. He's a *teacher*.
- Maya: Yes
- Candice: How long has he been there?
- Erin: 30 years
- Candice: 30 years? Like, 30 years of the same situation. I mean, our society is a mess right now. He probably had no contact with African-Americans or Latinos. So he only had what he saw in the movies or whatever. So he only had this perception, so he never had to deal with it, and now he's faced with it. And it's not even—it's probably unconscious. Because he's just, he's always been that way.
- Susan: But at some point, I think you kind of have to hold people accountable for their opinions because that, their opinions translate to their behavior, yeah, their work with their students. I just—  
(group discussion, March 23, 2010)

Sarah explained that by “soft bigotry of lowered expectations,” she meant having a “low opinion of your students.” Candice, however, did not judge or blame Mr. Jones for his

lack of understanding of his students in the same manner that Sarah did<sup>11</sup>. Instead, Candice described Mr. Jones' low opinion of his students as "probably unconscious." In her response, she drew upon elements of Mr. Jones's teaching context, such as the school's reputation and how the socioeconomic and racial backgrounds of the school's student population were changing from predominately White and middle class to include more students of color and students from lower socioeconomic classes. Mr. Jones' race is not stated in the vignette, but the vignette says that the teaching staff was mostly White (Crocket, 2008). By calling his actions "unconscious", Candice emphasized how prevailing discourses about race and class and ideas from the media the influence teachers' understandings of students.

In this way, Candice's understanding of Mr. Jones aligned with Pollock (2001), who suggested, "It is a widespread American habit to expect racialized achievement patterns from racialized children" (p. 10), even as individuals avoid acknowledging race. In her research in school settings, Pollock identified "colormuteness....Reluctance to navigate the question of how race may matter, we actively delete race term from our talk" (p. 11). Candice articulated where race was in Mr. Jones' comment by identifying the racial background of the students in his classroom. This is particularly significant given Pollock's findings of colormuteness in teachers' talk in schools.

Candice did not suggest that his beliefs or his actions were acceptable, but she attended to a difference between Mr. Jones' beliefs about students and the discourses that are framing them; that is, she attended to how these discourses position Mr. Jones. She did not label Mr. Jones as racist or suggest that it would be impossible for him to change. In a similar manner, Pollock (2008) encouraged her readers to think about how everyday

---

<sup>11</sup> Sarah's comment is analyzed in detail in the case of Sarah in Chapter 5.

actions may unintentionally harm children and not whether or not they were people with racist intentions: “This book... is not designed to get you to ask, ‘Am I a bad person?’ Instead, it is designed to get you to ask, ‘Do my everyday acts help promote a more equitable society?’” (p. xvii). Candice resisted categorizing Mr. Jones, blaming him his understanding (or lack of understanding) of his students, or defining his positioning as static. She did not use race and class, or more particularly, racism and classism, as lenses through which to critique Mr. Jones; rather, she used his positioning by prevailing discourses of race and class—social discourses that influence all teachers—to better understand his reactions. This is significant because while there was an opportunity to blame Mr. Jones, Candice chose to acknowledge and work within the prevailing discourses of race and class that framed his response and to weave Mr. Jones’ context into her understanding of him and his teaching in ways that other PSTs do not.

Specifically, Candice identified contextual and historical elements of Mr. Jones’ situation. She described Mr. Jones’ thirty years a teacher in that school as a long time, both because of the influence that the “same situation” (group discussion, March 23, 2010) would have on an individual and because of the historical changes in the US in thirty years. Candice assumed that Mr. Jones had been in the same teaching situation with “no contact with other African-American or Latinos,” and thereby he constructed his perception of his students based on racial narratives in the movies or other sources. She suggested that his understanding of students of color developed out of his lack of experience with students from different racial or socioeconomic backgrounds. She contextualized his reaction within “our society” and within the reach of the ever-present media, and she emphasized that these contexts are important for understanding his

positioning. Candice suggested that the current social and political context where “our society is a mess right now” influences how he is positioned by discourses of race and class, his understandings of his students of color and his students from lower socioeconomic backgrounds, and his expectations of his students’ abilities. Through highlighting that his identity as a mathematics teacher happens in a particular space and is influenced by other issues, Candice *used* these contextual factors to support her approach to viewing Mr. Jones as positioned by prevailing discourses of race and racism.

By stating, “*our* society is a mess right now,” Candice placed herself in the conversation about Mr. Jones and emphasized that *we* have a messy society where people such as Mr. Jones are unconsciously reacting to students because of their race or background and where prevailing issues of race and class also positioned her. Candice emphasized her own race and class as a part of how she sees herself as a mathematics teacher and also gave herself membership in many groups, suggesting that she, her peers, and Mr. Jones are positioned by prevailing discourses of race and class and including herself in her peer group. While this suggests her attention to prevailing discourses of race and class that frame all interactions in society, it also shows that she attended to race and class in the conversations in the seminar.

Candice, in attending to Mr. Jones’ actions, other teachers’ actions, and, in more detail later, how schools are structured within prevailing discourses of race and class, emphasized that everyday acts of teaching can be part of a class of actions that are not promoting an equitable society, even when unintentional. This aligns with Pollock’s (2008) definition of racism:

Any act that, even unwittingly, tolerates, accepts, or reinforces racially unequal opportunities for children to learn and thrive; allows racial inequalities in opportunity as if they are normal and acceptable; or treats people of color as less worthy or less complex than “white” people. (p. xvii)

Pollock emphasized the prevalence of *everyday racism*, as these acts occur in schools on “a daily basis” without educators “meaning to do this at all” (p. xvii). Similarly, Candice identified Mr. Jones’ act of not thinking that all of his students can do Algebra 1 as an everyday act of racism, particularly as it is unconscious and unchallenged. Even though Candice said that Mr. Jones was not being “malicious,” she recognized that he did not provide equal opportunities for all students. She suggested that prevailing discourses of race and class and everyday racism framed Mr. Jones’ understandings of his students and structured his way of thinking about mathematics teaching and his role as a mathematics teacher. These discourses also created school practices and school organizations that did not provide equal opportunities. She did not perceive Mr. Jones to be consciously attending to his actions as everyday acts of racism because of how historical and political contexts positioned him, but she did not suggest that he did not have agency in enacting instructional practices that could contest current social and political discourses or everyday antiracism and then position students as able to succeed. That is, Candice accepted the prevalence of everyday racism, but she did not accept that teachers’ practices need to support racism or that teachers are unagentic.

At the end of Session 1, PSTs hypothesized about Mr. Jones’ resistance to the new mandate of teaching all students Algebra 1. Melanie suggested that Mr. Jones had probably been “successful with his students” in the past, specifically that his students

scored well on state tests and that this may be part of his resistance to change. Maya made a discursive move to downplay Mr. Jones' assumed success with his students and suggested that he had been successful only because he had been teaching honors students, who are "already prepared:"

Maya: Like, he's not such a good teacher because I'm sure that he doesn't have to do that much. [Honors students] come already prepared.

Taylor: They're going to do well if he goes up there, and in one day, teaches them a concept. They're going to get it...

Michelle: I think that he is, he just recognizes how much effort it's going to take. I think that he seems very comfortable in the way the things have gone for the past ten twenty years and any change he knows is going to be more effort as a result of the fact that he's going to have to work harder and have to-

Candice: Are we assuming that, is he assuming that he won't have any more honors students? So maybe his perception of the, of the population, the African-American or Latinos or white people that are coming in, maybe he just has a bad perception of them. Out of every culture and every situation with kids, there are going to be high kids and low kids, and is he assuming that he won't have an honors class anymore? So, really it has nothing to do with his teaching or I don't think that it has anything to do with the kids. It seems more like his personal opinion of a certain group of people and their actual cognitive abilities more than anything. He can still teach the

kids who are honors. It's his personal— (group discussion, March 23, 2010)

Maya argued that it was his students' prior knowledge and preparation and not Mr. Jones' teaching that led to his students' success. In this way, Maya also suggested that it is easier to teach when students have prerequisite mathematics skills. Taylor maintained this idea, but specified how honors-level students may understand new concepts more easily and thus may be smarter. By emphasizing that Mr. Jones' job was easier when he was teaching the honors students, Maya, Taylor, and Michelle implied that his job now would be more difficult.

Candice interrupted Michelle. She stepped back from the question of *how* Mr. Jones' job will be more challenging to ask *why* it should be more challenging at all if he is still teaching honors students that are “already prepared” or “are going to get it” (group discussion, March 23, 2010). She emphasized that there are going to be students who perform differently, and Mr. Jones should not assume that he would not have honors-level students in his honors classes or that the mathematical knowledge of the students in the honors class will necessarily change because the demographics of the school population are changing from predominantly white middle class to more socioeconomic and racially diverse. Candice concluded that Mr. Jones' comment cannot be only about the mathematics knowledge of students, but instead about the relationship between students' racial or socioeconomic background and their cognitive abilities.

Candice also used Mr. Jones' response to suggest that his issue was not about his teaching ability or level of comfort in teaching students but it was about his opinion of the “African-American or Latinos or white people that are coming in” as not smart



enough to be in honors classes. Specifically, she suggested that he assumed that as the school population moves from predominantly white to more diverse, the demographic makeup of his honors class would change also, and the students in his honors class would not be honors level.

Previously, in referencing how long Mr. Jones had been teaching and suggesting that he had not had any experiences with African-American or Latino students, Candice explained his actions using the social and political contexts of his teaching. In this episode, Candice's discursive moves were different because she used Mr. Jones' *actions*, analytically, his positioning in performance, and not the context of his school or the social contexts to suggest how he is positioned by prevailing discourses of race and class and how he responds to students positioning them as unable to do mathematics. Across her comments regarding Mr. Jones, Candice identified positioning as relational, as contextual, and in his performance as he responded about his students.

Candice also identified the influences of prevailing social discourses and how they, as presented in the media, frame individual's understandings of students during Session 6. In this session, we watched a clip from the television drama series, *The Wire*, which is set in a low-income neighborhood in Baltimore, Maryland. In the episode that we watched, the main plot line centers around how the White teacher creates a mathematics lesson around gambling and playing with dice in order to teach his African-American students from this neighborhood about probability and engage them in mathematics (Full transcript in Appendix H). I used this episode and related to discussion prompts to encourage PSTs to attend to how this television drama series presents teachers and students, how it may perpetuate social discourses of racism and

classism, and the potential implications for teachers and students (Chapter 3 includes more information about this activity and the rationale).

PSTs' initial conversations focused, however, on the students' and teacher's actions, and they responded as if the students in the television drama were real students. For instance, Norah described the students as *real* students, not actors, and hypothesized about what they could need in their classrooms:

These kids aren't excited about learning because it doesn't seem like the teachers that they had prior to this guy haven't been very exciting in their lessons... So I think maybe some of the reason these students aren't motivated is because they haven't been given a reason to be motivated. (group discussion, June 1, 2010)

Norah added details and built on her personal understandings in order to describe what she saw. She emphasized that the teacher's lesson mattered to the students and how for one student in particular, the probability lesson encouraged him to do his homework and "see a connection between math and real life." She interpreted the student as saying, "Oh, wait a minute, if I learn math, I can apply it to these things that I want to do in my life and maybe be better at it" (group discussion, June 1, 2010). In this manner, Norah and others did not initially attend to the implicit discourses framing these interactions presented in the episode. For example, I wanted Norah to think about how the teachers was presented as a savior or how African-American students were portrayed as playing dice or as uninterested in school.

Candice moved to distinguish between reality and *The Wire*'s presentation: "I think [the television drama] brings up a lot of racial stereotypes and social class type. Like, you live in this type of neighborhood, I've symbolized you guys, and like, the white

teacher comes and saves the day” (group discussion, June 1, 2010). Candice interpreted *The Wire* as characterizing students from a particular neighborhood and perpetuating stereotypes about students from particular racial and socioeconomic backgrounds.

Other PSTs initially contested Candice’s comment and understood her as criticizing the teacher. For example, Norah explained that the teacher was “reaching out” and took the students’ lead in designing the lesson. Candice clarified that she was not suggesting that the teacher was stereotyping his students, but rather the directors and writers of *The Wire* were. In the discussion, PSTs moved to emphasize the importance of being a critical viewer when watching similar television dramas. Candice and Taylor also problematized how to get teachers to live in areas where they teach, recognizing that few people, including the people who currently live there, want to live in a potentially dangerous urban area. Candice saw the students as developed by the directors and producers of the drama series, not as real students, and thus, the drama series sends a message about students from low-income neighborhoods as not excited about learning, not motivated, or needing saving, essentially the messages that Norah pulled from the episode.

Candice also presented her analysis of Mr. Pryzbylewski, the White teacher who introduced the students to how to calculate odds, as “the White teacher who comes in to save the day” (group discussion, June 1, 2010). Her understanding of the teacher was not in relation to what he taught or how he engaged with students, as he is presented as thoughtful and interested in promoting students learning. Candice identified how media perpetuates prevailing ways of thinking about students from different racial backgrounds, the role of the white teacher, and ways of teaching students, and she made a distinction

between what messages the show is saying about students and teachers from her own interpretation of the show. Candice did not suggest that Mr. Pryzbylewski's practices of engaging students using dice were inappropriate or that some students from Baltimore do not play dice; rather, she contended that there was a problem encouraging these discourses about students, teachers, and teaching.

During our conversation, I shared an incident that had happened over the weekend when I was driving through Baltimore with my parents. As my parents were familiar with and had seen episodes of *The Wire*, they mentioned that the area we were driving through looked like the backdrop of the series. When a young African-American boy ran up to the side of a stopped Cadillac, my White father said, "I wonder if he's a hopper," which is how *The Wire* referred to children who were sent to be on watch for the police. In recounting this story in our seminar, I shared how I told my father how inappropriate this was and "gave him hell for it"<sup>12</sup> (group discussion, June 1, 2010).

Candice reacted to my father's story in a manner similar to how she reacted to Mr. Jones, identifying how my father was positioned and thus understanding but not excusing his response:

And I think it is the responsibility of people making movies and people that, um, that are producers or television show makers, whatever, they, directors, and stuff like that. I think they, they, um, they play on people that are not very educated, and I think most people know what they are doing when it happens because those stereotypes, if that's the only thing you've ever known, when you see a kid like, that's what's going through, that's your background knowledge. That's the

---

<sup>12</sup> I discuss my positioning as a facilitator in the chapter on the implications of this research for mathematics teacher education (Chapter 9).

connection that you're going to make, whether you really believe it or not. If that's your only connection, that's the connection you're going to make and I think even as like teachers and teacher educators and stuff like that, like if you don't come from a certain community or if you don't have that background knowledge, you can't necessarily be blamed for not having the knowledge but as an educated person, but I don't even think the majority of Americans are educated, like I'm about to be making a blanket statement. Like I don't think that you know the regular old people that, American Idol watchers and all those type of people, I don't think they think about things critically because they don't have to.

Candice used historical and social contexts to understand and explain my father's reaction, and she emphasized context and the media, similar to her discursive moves in the conversation about Mr. Jones. In this response, however, she added more details about how movies, an individual's lack of experiences, and whether or not someone thinks critically about their positioning are important elements of understanding an individual's positioning.

Candice suggested that people who do not think critically are going to be influenced by context or their lack of understanding in different ways than people with background knowledge because they will make different connections. She suggested that teachers' and individuals' backgrounds influence how they understand others and she did not blame them for this lack of understanding. Consistent with her comments about Mr. Jones and other teachers, Candice understood social context and media as influencing positioning. She hypothesized about how this develops, emphasizing how learning and interpreting are related to connections that people make to their context and their

situations. Candice suggested that individuals must attend to and think critically about how they are positioned.

***Enacting a principle of everyday antiracism in education (Sessions 1 and 2).***

With her comments about Mr. Jones, Candice conveyed a principle of teaching response, that is, a principle that guided her teaching (Horn & Little, 2010). She introduced the importance of “believing that all children can learn,” and during the seminar, this developed into a principle or “core idea about how to pursue racially equal opportunity and counteract racism from within schools and classrooms” (Pollock, 2008, p. xx). Specifically, Candice articulated that believing in students meant seeing beyond differences that do not impact learning or success and treating all students as capable. Because this is a salient theme across this analysis of Candice and in order to discuss this principle across this case and other cases, I identified this principle as: *Principle 1, Responding to students*: When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx). This principle is consistent with the first of four foundational principles of everyday antiracism in education, as delineated by Pollock (2008).

My analysis suggests that Candice used this principle to characterize teacher actions and as a goal for teachers and school policies more generally. For example, at the end of Session 1, Maya contrasted the test-driven culture of schools and schooling in her context with the more “subjective” schooling and grading practices in Argentina: “Where I went to school, everything was more subjective. Like, your teacher, and your professor, and your principal at the school you were, I mean, they decided, like how they were

teaching and what they were accomplishing in their rooms. It was up to them and their responsibility” (group discussion, March 23, 2010). Maya described her schooling experiences as not dictated by the same institutional pressures that govern schooling in Graverly County where she interned.

Candice problematized giving teachers autonomy, specifically identifying how Mr. Jones and teachers with similar deficit views of students may not support all students to learn and suggesting that the systems structuring schools may guide teachers in ways that could support students:

But then also, what if there is someone like Mr. Wilson, or Mr. Jones or whatever his name was, and he, and the population does change at his school and he has 15 African-American kids and he has 8 Latino kids, how is, how IS he going to teach those kids? I mean, so, that's why I think that there is a reason that we have these mandates and different things like that, but there has to be some differentiation, like you said. Somebody has to think about, you have to think about this critically before we just say, “Oh, everybody should do this.” Yes, everyone should do this, but you have to make sure that the person is not trying. You know, you have to, you have to talk to them or know where their head is or something. Like you can try all you want, some kids aren't going to achieve that just because of their background or just because of the background knowledge that they have before. But those Mr. Wilsons or Mr. Jones, they made it this way, I think, or Mr. Whoevers that weren't teaching certain people because we have such a diverse community, and some people just don't think that they can learn. (group discussion, March 23, 2010)

Candice questioned what kind of teaching is happening when the teacher does not believe in his or her students or does not treat all students as capable and worthy. Candice did not ask, however, how will he facilitate a lesson, for example, but she suggested that without a principle of treating all students as capable (Principle 1), he would not be able to engage in the whole of the work of teaching or the being of a teacher. She described a cycle of how teachers who do not think that all students can learn are perpetuating certain students' lack of achievement.

Candice suggested that institutional and political mandates could support students' access to opportunities to learn because through their compliance, teachers would be enacting practices that would allow access to opportunities to learn for all students. She emphasized that teachers are individuals who have been influenced by social and political discourses and have particular understandings of students, especially students from diverse backgrounds, thus they may not encourage all students towards the goal of Algebra for All if it were not mandated. She emphasized teachers' responsibility for teaching Algebra 1<sup>13</sup>; earlier in Session 1, Candice explained the logistical supports that teachers would need in order to teach the mathematics specifically<sup>14</sup>. In this response, she identified the benefits of district-level mandates and how they align with

---

<sup>13</sup> Earlier in Session 1, Candice asked how Algebra 1 was different from the algebra that is taught in elementary schools. In this vignette, the details of what Algebra 1 is as a course is not explained. It is unclear if Candice understood how Algebra 1 is a foundational course for future courses in mathematics and thus functions as a gatekeeper to more advanced mathematics courses. Additionally, in this state, students must earn a passing score on the Algebra 1 exam in order to graduate high school; this policy and the relationship between success in Algebra 1 and graduation are not described in this vignette. None of the PSTs identify Algebra 1 as a gate-keeping course for high school mathematics courses or as a graduation requirement.

<sup>14</sup> Candice said, "The district is going in the right direction to say, 'Look all of our students are willing, are able to do this Algebra 1,'" but she described how the district needs to provide supports and resources in order to implement a policy such as *Algebra for All* (group discussion, March 23, 2010). For example, she emphasized that the district needed to provide teachers across grade levels with time to support students outside of class and opportunities for teachers to learn more algebra also.



Principle 1, but she did not problematize how they are operationalized in classrooms and schools and the pressures teachers feel as a result. It is significant that teachers in the vignette emphasized the pressures they felt to meet the district-level benchmarks, and Candice identified these pressures in her own context earlier in Session 1.

When interpreting Mr. Wilson (in Session 1) and Mrs. Carlton and Angela (in Session 2), Candice embraced everyday antiracism in her own practice, specifically, her principle of teaching response, Principle 1. Candice identified how they are positioned in relation to their contexts and current social dynamics, and she treated these teachers as complicated and capable of learning and changing. For example, Candice suggested that Mr. Jones could take part in professional development and has the capacity for change. In this manner, she highlighted that teachers' positioning, both how they are positioned and how they position themselves, are fluid and influenced by context and continued learning opportunities. She understood Mr. Jones as in a particular context including his school site as an institutional context and the social context and how these were influences on his understandings of students.

Across sessions, her attention to the performativity of identity rather than individuals as static did not mean that she excused individuals from their actions but rather is evidence of her resistance to evaluating teachers on *an* identity and her attention to how individuals are positioned. In Session 2, for example, PSTs read a vignette about a white teacher Mrs. Carlton; Angela, an intern in the class (whose race is not mentioned); and, Benjamin, an African-American student in the class, who was not performing well in mathematics class. In the vignette, Mrs. Carlton is exasperated with Benjamin and insists that he is "a low achiever." Angela completes a case study and

learns more about Benjamin, his family, and his abilities to do mathematics outside of the classroom (more details and the rationale for using this vignette are presented in Chapter 3; the vignette in full is in Appendix D).

The vignette presents Angela as “fascinated by Benjamin’s family life,” which could be interpreted as condescending or patronizing (Crockett, 2008). The vignette describes Benjamin’s home life as stable and how Angela is surprised by this because she assumes that a single parent would not be able to provide a student with a “reasonably stable” home life or an “after school routine that included homework and chores” (Crockett, 2008). I asked PSTs what they thought about these lines in particular.

Candice emphasized Angela’s changing positioning:

Well, it's interesting that she was honest about that, and a lot of times you go into situations and people act like they didn't think that, but though initially they did, and I kind of respected her honesty for saying that. I thought that was like, “Well, I started out whatever, and then I was like, I know a lot of people think that, but I know a lot of times.” There is this background knowledge because she's never probably had that experience to go into a single household, probably a single black household. It was commendable to me that she went in and found out and now she'll always have that experience, like I know this kid Benjamin. (group discussion, April 27, 2010)

Candice described how Angela, similar to Mr. Jones, had not had experiences with all students. She identified Angela’s understanding of parents, similar Mr. Jones’ understanding of his students, as in response to outside influences and prevailing discourses about racism, classism, and parenting that also frame her interactions. It

seems that Candice assumed that Angela was White. Candice was not surprised that Angela thought negatively about single-parent families or single-parent Black families, and she did not criticize Angela for her opinion. Rather, instead of creating static categories, Candice suggested that Angela can change how she is positioned by issues of race and class and how she positions herself. She also commended Angela for learning about Benjamin and attended to Angela's multiple experiences. In her interpretation of Angela, Candice embraced her own principle of antiracism in education and identified the positioning in the performance of Angela, as well as how Angela is positioned because of the contextual and relational elements of her situation.

*Summary of Objective A.* These episodes show examples of how Candice identified and examined the implicit discourses defining mathematics teacher and in teaching situations, particularly discourses of race and class and how they surface in teaching and schools. Candice grounded her own analysis of mathematics teachers and teaching around issues of race and class, particularly how individuals are positioned in relation to everyday acts of racism. It is significant that she recognized the different ways that individuals, including herself, are positioned in relation to prevailing issues of race and class, but she resisted holding individuals accountable for their positioning. Candice's talk is consistent with what Pollock (2001) identified as "denaturalizing racial achievement patterns: to name them and claim them as things that we, together have both produced and allowed" (p. 9-10). Across the episodes presented in this seminar objective, Candice demonstrated how she is reflexive about positioning as contextual, as relational, and in performance.

**Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.** In this section, I focus on how Candice examined the implications of the prevailing social, political, and institutional discourses and current school contexts on teaching, students, and teachers in episodes from Sessions 1 and 2. In her participation in these episodes, Candice was reflexive about her positioning but did not fully problematize teaching. That is, she specified her principle of everyday antiracism in education (Principle 1) but she did not consistently engage in the interplay of principles, strategies, and actionable steps or the discursive practices of problematizing practice. In this manner, this section demonstrates how Candice did not consistently demonstrate this objective across these episodes.

*Examining institutional pressures, social contexts, and the relations between them (Sessions 1 and 2 and Vision statement).* In Session 1, Candice described the pressures she felt in an era of test-based accountability and how standardized testing influenced her teaching:

Like [the state assessment]? Like standardized tests? ... [It influences] just how I teach because there are certain things. It's well, the connections, like legislation, I guess, more so, or so, because legislation is like. It's saying basically, like, you are not a good teacher if your students don't do good on the [state assessment] or whatever test it is. Like, with the No Child Left Behind thing, um, it might influence where I teach because I might choose not to teach at a school where I won't, where I already know the students won't make AYP [Annual Yearly Progress] or you know, reach those benchmarks, where as, that's, I'm all about

them right now. And I see the struggles that my teachers are going through because they have made the sacrifice to teach at a school where the students were not high-achieving. (group discussion, March 23, 2010).

Candice identified how education policy, the resultant accountability pressures, and the related tests positioned her as a teacher and had implications for her teaching and how she understood her options of where to teach. She felt pressure to ensure that her students met particular benchmarks and felt that her reputation as a teacher was related and dependent on her students' achievement on high-stakes tests. Although Candice identified her desires to support all students to learn, she also explained that there are personal sacrifices that she would have to make in order to teach in certain schools.

Laura, Michelle, and Candice continued to discuss testing in schools. Laura described a tension similar to Candice, identifying how in "certain places," presumably test-drive school contexts, she felt that she had limited options or "freedoms" for how she could teach: "If it's a priority to me to teach in a way that I want to, I'm really limited to places that are going to give you that freedom" (group discussion, March 23, 2010). Laura and Michelle described how they felt positioned by the accountability pressures in their school contexts and how these pressures influence how they teach and what they teach<sup>15</sup>.

Brooke responded and asserted that teachers in her school do not "teach to the test," and instead put a "more meaningful spin on their instruction" (group discussion, March 23, 2010). She acknowledged that test preparation may not support student achievement:

---

<sup>15</sup> Laura's comments are analyzed in the case of Laura in Chapter 7.

Brooke: Well, and I think, I think that it's just a matter of how you look at it. I know a lot of the second grade teachers right now are not teaching to the test. You know, they hit those standards but they are really making sure that they are giving a more practical, a more meaningful spin to their instruction and I think that is really valuable. I was listening to a principal speak last week, who was like, you know, once we start scaring the living daylights out of our kids about tests and you know all of the things that they need to learn, it doesn't become about obtaining knowledge anymore it becomes about taking a test, and naturally, they are going to do worse on it. So, I know a lot of teachers at my school focus on you know giving kids a really full understanding of math so they can go take those tests and do well. And that seems to be unique from what I've heard in the program

Candice: I've heard Eastern County is just different anyway than Graverly County. I think a lot of that has to do with stigma, though. Eastern County is more wealthy; Eastern County has a different population. Graverly County is, I heard about Graverly County before I even came to [State]. You know what I mean? And then I heard different people who said they didn't want to teach there, and all type of different things and so I think that all of that has to do with it. And you have to think about those different things and the population that I'm teaching is totally different from yours, the

community, and everybody is talking about community is where the school is and it's not a place where anybody wants to go or live, you know what I mean. So, that impacts it a lot. (group discussion, March 23, 2010).

Candice responded to Brooke, contrasting her experience and their different contexts. She emphasized the prevailing discourses of race and class in her local context in Graverly County as having implications on Graverly County teachers, their practices, and the practices that were available to them. That is, she linked her school context and its test-driven culture to the social dynamics. Specifically, Candice detailed how the location of the school, whether it is in Eastern County, known as a wealthier county as compared to Graverly, and or in Graverly County, known as having a much higher African-American and Latino student population and home to communities that are “not a place where anybody wants to go”, matters for how the teachers teach. Thus, she suggested that she and Brooke have different options for how to subvert their positioning in the classroom. In this manner, Candice identified how understandings of self as teacher and of teaching are framed within these discourses of race and class.

Candice also discussed these restrictions and policies in her vision statement written after Session 1, and she wondered if she would still be teaching in five years:

In 5 years, I see myself teaching in a school that is very student-centered. The students will have the ability to “do math” instead of listen to it. The school will relate to real-life instead of taking away from real-life. In 5 years, my classroom will have a student library corner where students will be able to write about their frustrations, success, and desires. Math will be practical. 5<sup>th</sup> grade math will not

have a textbook per se. They will learn math in a setting that is natural and welcoming for my students. We will use many manipulatives even in 5<sup>th</sup> grade. Realistically, I probably will not last long in a classroom. The restrictions and politics that teachers have to go through will drive me out of the classroom into the streets. (Vision statement, March 23, 2010)

Candice presented mathematics teaching as a process of engaging with materials and making sense of “real-life.” In this manner, she emphasized how she can position students in relation to mathematics in a way that is meaningful, “welcoming,” and supportive of their personal growth and access to opportunities to learn. Candice described each strategy as an alternative to a strategy that is likely in her current context: “The students will have the ability to ‘do math’ instead of listen to it,” and “The school will relate to real-life instead of taking away from real-life” (Vision statement, March 23, 2010). Through detailing alternative strategies, Candice repositioned herself in relation to the teaching in her current context.

Although she listed teaching *strategies*, her actionable practices are less clear. She also noted how she felt that she would not “last long” in the classroom (Vision statement, March 23, 2010). Candice identified that “regulations and politics” and the resultant institutional pressures that will influence her enactment of this vision. In this manner, her vision statement did not present her confidence about repositioning herself or her understanding of her options for her teacher practices in certain teaching contexts.

In Session 2, Candice examined these institutional pressures and their relations to the social and political contexts of schooling. Laura said that teachers need to choose between teaching in a school that has student-centered programs and supports teacher



autonomy and a school that served a student population that is less “privileged” but is regimented and test-driven<sup>16</sup> (group discussion, April 27, 2010).

Following her comment, I asked, “Why is that?... Why does [the neighborhood] influence that we can’t have an arts-based school in Graverly County?” (group discussion, April 27, 2010). Graverly County is known, not only as with a student population that is more racially and socioeconomically diverse than the student population in Haverford County, but also as subscribing to a more “test-driven” school culture (Valli et al., 2008).

Candice responded that the population of the neighborhood, not specifically the school, is related to why there is not an arts-based school:

The populations. The people that are over there. You have to, it's a societal thing. It's how you treat certain people, how you treat other people. It's how Molly [one of the school site coordinators] is, every time, she says, it's like, “Fairness isn't giving everyone the same thing it's like what you--” that's just bull crap. Like, that, that's just a justification for what's going on. Like these people deserve this, this is what they need, this is what they need. Like, why don't they need a, um, arts program? Because they don't “need” [finger quotes] that. You don't “need” that in that neighborhood. You *need* a regimented [school program] because *you* don't have this structure or *you're* not meeting these test scores. (group discussion, April 27, 2010).

When Candice said, “It’s a societal thing,” she recognized that all people are not treated equally, and incidents of everyday racism happen in schools, other institutional environments, and everyday interactions, more broadly. Everyday racism has

---

<sup>16</sup> Laura’s comment is analyzed in detail in the case of Laura, Chapter 7.

implications on school culture and structure. Her comment is consistent with how she identified an underlying issue of race and class in Mr. Jones' comment and his positioning by these issues. To Candice, treating people differently not is an appropriate definition of fairness. She cited Molly's comment<sup>17</sup> as an example of the "societal thing" or prevailing view of certain students and what they deserve. She suggested that some populations of students are not getting the same resources or attention as others because administrators or others in positions of power have decided what students' needs are. Candice questioned the value of regimented school programs and using students' test scores to implement a regimented or test-driven school program because she believed that all students deserve access to arts-based programs, and more generally, equal opportunities. This episode illustrated how Candice defined prevailing discourses of race and class as influencing teachers, students within their school contexts, and schooling more generally. She emphasized the importance of providing equal opportunities to all students and how Molly's principle did not justify the lack of equal opportunities.

Candice, however, did not problematize *how* to provide students with equal opportunities across contexts. Across Sessions 1 and 2, PSTs struggled to normalize problems and left principles as stated, that is, without specifying or revising before generalizing. In this way, normalizing practices served not as a starting point for conversations about practice, but turned conversations away from teaching. For example, after Candice's comment, Paige asked, "Why would kids who come from a Title 1, poorer, need more discipline? Why do they need this discipline?" (group discussion, April 27, 2010). Paige's comments had the potential to move the conversation to question

---

<sup>17</sup> Molly's full comment was "Fair does not mean equal. Fair is everyone getting what they need" (group discussion, April 27, 2010).

why students need more discipline, or specifically for thinking of the causes for this racial inequality. However, this problem was not taken up. Instead, Brooke provided a response that served to answer to Paige's question: "Schools don't get to do these arts programs because they are helping to meet these basic needs of students. They are sending home food packages with the kids and I would imagine that is common in these Title I schools" (group discussion, April 27, 2010). Brooke's comment turned the conversation away from Candice's (and Paige's) issue, and Candice, Paige, and also the students who do not have an arts-based school were positioned as without agency in this situation or in responding to this problem:

This turning away tended to obscure any relationship between specific instances of trouble or surprise and endemic dilemmas of teaching (a class of problems), while positioning the problem poser as relatively helpless in the face of circumstances beyond his or her control or as a passive recipient of others' advice. (Horn & Little, 2010, p. 192)

Normalizing practices that turn conversation away from problems of practices or unelaborated principles, such as Candice's emphasis on everyday racism, do not provide as generative of a space for teacher learning as strategizing about current responses might have and do not support teacher agency in addressing the problem (Horn & Little, 2010). In this episode, the problem of unequal opportunities for students was left unexamined, and PSTs did not strategize about an arts-based school within the context of testing, for example, or specify a principles or strategies.

Without problematizing, PSTs or teachers may be left feeling resigned (Pollock et al., 2010). Generic consciousness of racial or economic inequality "can actually be

deadening for both educators and students unless analysis pinpoints concrete ways of counteracting racial inequality” (Pollock et al., 2010, p. 213). The conversation may have been supportive of PSTs general consciousness because Candice and Paige identify evidence of everyday racism, but without discussing strategies or specifying teaching practices, PSTs did not identify concrete applications to practice. Evidence of *shifting* understandings of mathematics teaching would include attention to Pollock’s (2008) different levels and engagement in the discursive practices of specifying, revising, and generalizing (Horn & Little, 2010). When Candice identified that the lack of arts-based schools for all students is a strategy or action that is “*not* compelling for classroom use” (Pollock, 2008, p. xx), she defined what everyday racism would look like in classrooms. This strategy, however, did not develop into a general framework for practice or a “resource for thinking through future problems” (Horn & Little, 2010, p. 202).

***Responding to problems of practice and engaging in discursive practices that move the conversation away from problems of practice (Session 2).*** In Session 2, in response to the vignette of Mrs. Carlton, PSTs investigated Mrs. Carlton’s practice. For instance, Taylor suggested that Angela, the intern, should challenge her mentor, Mrs. Carlton:

I think that [Angela] also could have asked Mrs. Carlton if she could to do a lesson that was engaging and then see the reaction of the kids. And as they are talking about the lesson afterwards, say, “I think that it went really well”, and then maybe, “We should do that again.” So, not to attack her way of doing it, maybe show a different way. Like, “It went really well.” (group discussion, April 27, 2010).

Taylor described practices that addressed the mentor-PST dynamic as well as gave Mrs. Carlton an opportunity to learn from Angela. Taylor provided specific actionable steps that could have potential for in this situation in this specific classroom and with its dynamics (e.g., Pollock et al., 2010), but the principle behind Taylor's comment was not explicit.

Michelle included instructional moves that could have served as actionable steps, such as basketball as a context for mathematics problems. Candice suggested that the problem was not what Mrs. Carlton was *teaching* but *how* she positioned Benjamin: "But like she's wrong, she said that like he needs special education, but he scores high. It's like she doesn't even care. Like she's just focused on his behavior. It doesn't sound like she's trying" (group discussion, April 27, 2010). She suggested that Mrs. Carlton was not seeing all of her students as capable and worthy, and her actions served as evidence of her not attending to student differences.

Candice identified and situated her principle for teaching response, Principle 1 in this example, but she did not describe actions Mrs. Carlton could take that would relate this principle to Mrs. Carlton's practice, or take up either of the strategies or actionable steps suggested by Sarah, Taylor, or Michelle in relation to her principle. While Taylor and Michelle provided specific actions, Candice identified a different problem. She emphasized that the problem was how Mrs. Carlton positioned her students and thus she was more concerned with Mrs. Carlton's understandings of Benjamin and her lack of understanding of how to address his needs and less concerned with outlining practices that Mrs. Carlton should enact. It is not clear how Candice would operationalize this principle in this example. Taylor's idea of creating and coteaching a lesson with Mrs.

Carlton could support Mrs. Carlton as seeing all students as worthy and capable and aligns with Candice's principle, but Candice does not relate Principle 1 to Taylor's practice.

When other PSTs suggested practices that Mrs. Carlton and Angela could enact, Candice emphasized the importance of Mrs. Carlton knowing her students' backgrounds:

But that's kind of disturbing that she doesn't know his background, or does she know his background and she's just like, "He's bad but he's smart"? And you know, like, if she knew he was like on grade level, she maybe would have realized that he's not being challenged and that's where behavior comes from.

And that's the first thing, you know, the books tell you. Like, oh, most of the time behavior problems are either bored or they need attention. (group discussion,

April 27, 2010)

Candice highlighted the importance of knowing students' backgrounds and introduced another principle of practice, a principle for interpreting student behavior and student learning: *Principle 2, Interpreting and understanding students*: Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning. Candice described the importance of getting to know students' backgrounds as related to Principle 2, but she did not engage in the discursive practices of specifying and revising. Envisioning and articulating alternative strategies in concrete ways may support Candice in operationalizing and enacting Principle 2. In this episode, Candice introduced this principle, but then hypothesized that if Mrs. Carlton had known that Benjamin was on grade level, she would have realized that she should provide challenging work him. That is, she suggested that a particular level of *performance*

would demonstrate Benjamin's ability and did not specify *why* Mrs. Carlton might be not seeing Benjamin as competent or capable, even if she knew his previous scores were on grade level. She offered categorical advice: Mrs. Carlton, once she knew Benjamin's scores, should present him with more challenging work. This strategy did not address Principle 1, her principle of teaching response, specifically rejecting *false* notions of difference. In this manner, she introduced a principle for understanding students but did not relate it to teaching actions consistent with Principle 1.

Candice's comments also turned the conversation away from a problem of practice. Although there are other potential reasons why Candice's comments here and above were not taken up by the group, Candice did not specify Principle 2 with actionable steps and offered advice about providing students with challenging material, thereby normalizing the problem of understanding student differences and leaving the problem itself unexamined; that is, Candice's discursive moves did not serve as a starting point for more conversation. Candice and other PSTs normalized the problem by not defining, elaborating, or reconceptualizing the problem. Other problems of practice, such as how teachers can get to know their students and the reasons for this, were emergent in this case and PSTs' responses. Why should Mrs. Carlton get to know her students and why does she not know about Benjamin's background? Is it really an issue of Mrs. Carlton having access to Benjamin's scores? What would she think of his scores? None of the PSTs raised these questions. Candice and other participating PSTs did not consistently problematize practice in Sessions 1 and 2.

***Summary of Objective B.*** These episodes present how Candice specified and examined the implications of prevailing discourses of race and class on teachers,

students, teaching, and the social and political contexts of schools. In discussing the differences in teaching practices across counties, Candice detailed the institutional discourses of accountability, as well as the prevailing discourses of race and class and their influence on teacher practice. The vignette about Mr. Jones, Mr. Wilson, and their school provided opportunities for PSTs to engage in the multiple institutional pressures that teachers face and ways that the teachers are positioned by them, but Candice focused on Mr. Jones' lack of attention to a principle of antiracism in education (Principle 1) and not pressures that he may feel from his district or the curriculum benchmarks. Her attention to her positioning by both the current accountability pressures in her school and the prevailing social discourses of race and class, but her focus on only Mr. Jones' positioning by prevailing discourses of race and class, may suggest that she is not yet connecting these issue for Mr. Jones or the ways in which the activities offered different opportunities for her to discuss Mr. Jones' multiple positioning or her multiple positioning. That is, it is as yet unclear in what ways she feels agentic in responding to either the institutional discourses of accountability or to prevailing issues of race and class in schools.

Across the seminar sessions, Candice was consistently reflexive about her positioning, but did not consistently problematize teaching. Specifically, she was not consistently clear about the strategies or practices that she identified with her principle of everyday antiracism in education or how she understood mathematics teaching consistent with Principle 1. It is important to consider the conditions that supported Candice in problematizing teaching in some episodes and not the episode with Mrs. Carlton, for example.



**Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher.** In this section, I focus on how Candice critiqued prevailing political and social discourses in relation to herself as a mathematics teacher and how she identified alternative ways to position herself. In her participation in these episodes from Session 3, Candice was reflexive about her positioning and articulated how she and other teachers can reposition themselves in relation to prevailing discourses of race and class that influence teachers, students, and teaching. Candice identified how particular views of mathematics and students' abilities influence teachers and the ways in which she challenged these views by repositioning herself in relation to them and suggesting that other teachers do the same. Candice demonstrated this objective through the manner in which she related a guiding principle of everyday antiracism in education, specifically principles of teaching response and principles of interpreting and understanding student behavior, to how she understood herself as a mathematics teacher and the ways that she described positioning herself as a mathematics teacher.

***Critiquing mathematics teaching and relating mathematical vocabulary and access to mathematics (Session 3).*** In Session 3, PSTs read the lesson transcripts of Teachers A and B, where two teachers present an introduction lesson on domain and range (Appendix E; the rationale and brief outline of this vignette are presented in Chapter 3). In our discussion, PSTs did not like Teacher A's lesson because of the emphasis on vocabulary, and instead, they appreciated how Teacher B suggests a connection between the terms and concepts and does not emphasize definitions. Candice

suggests that Teacher B was putting the mathematical vocabulary in context, both through how he used everyday language to define the vocabulary and how he drew a graph: “Teacher B was also showing what it meant. Teacher A was just saying the words. It was confusing to us because if we could see what he was doing we could connect it to whatever the visual he was doing” (group discussion, May 11, 2010).

Melanie and Candice also both admitted that they are confused by the mathematics in both lesson transcripts, which I address in my discussion about facilitating elementary PSTs in this investigation of mathematics teaching in Chapter 9. Candice suggested that Teacher B’s visual representation may have supported her understanding of the information, but there was a not video of Teacher B or a diagram in the transcript to support her. I chose lesson transcripts that dealt with mathematics content that elementary PSTs may be less familiar because I hypothesized that as PSTs were unclear about the mathematics, PSTs would see the benefit of Teacher A’s clearer, more informative presentation and interrogate the lack of mathematical content in Teacher B’s presentation (detailed rationale for this session is in Chapter 3).

After we discussed the lesson transcripts, PSTs read Teacher A’s and Teacher B’s interviews. Laura explained how she thought that Teacher A’s lesson was boring and not supportive of student learning in the way that Teacher B’s lesson was, and that although Teacher B’s point that all students may not need this mathematics could be valid, Teacher A has higher expectations because he thinks that his students can be mathematicians (group discussion, May 11, 2010). Paige identified how there was a particular view of how to teach mathematics that was present in her mathematics methods course and the ways in which Teacher A’s presentation conflicted with this view. She clarified how

Teacher A's teaching could align with high expectations, but "he values the vocabulary" more than she did (group discussion, May 11, 2010). Laura and Taylor suggested that earlier or later parts of his lesson could have included other instructional practices, such as opportunities for students to explore graphing. In this manner, they suggested that his lesson could reflect his high expectations of his students but these elements of the lesson were not included.

Similarly, Candice read Teacher A's response in relation to his interview, identifying how a teacher could emphasize definitions, use a direct style of teaching, and also profess to have high expectations of his students as mathematicians:

I think this is like a model of how teachers really teach, though. I think they tell you how to do it and then they expect you to apply it. And I think that follows his comment [in Teacher A's interview]. It's like, "Okay, I taught it to them. I told them how to do it, and obviously they are going to be mathematicians because I am such a great teacher and because I told them each step. Then, you know, 'One and only.' You know, I was emphasizing important points. So obviously, they are going to master it. So, obviously they are going to master it." So I think that's really how we teach kids, especially in math. Like, we give them the vocabulary and you model it. (group discussion, May 11, 2010)

Consistent with how she understood Mr. Jones, Candice identified how Teacher A's relation to mathematics and how he understood mathematics positioned him towards mathematics teaching and his students in particular ways. Specifically, she suggested that he may have the high expectations of his students that surfaced in his interview and then hypothesized how this could be present in his teaching. She felt that it was

important to understand his view of mathematics before criticizing how he did not have high expectations. Candice mocked Teacher A's approach of "emphasizing important points" and then the relations between this approach and student mastery, which suggests that she did not feel that Teacher A's teaching style provided students with opportunities to learn. Through mocking the way Teacher A perceived his teaching, Candice repositioned herself in relation to these practices and emphasized that teaching students mathematical vocabulary terms through lecture is not effective. However, she did not criticize Teacher A's understanding of his teaching and understood his response as related to how he understood mathematics learning and effective teaching.

PSTs seemed to resist criticizing Teacher B's lesson. For example, they appreciated his attention to relational elements, such as the emphasis on what "*we* are going to do today," suggesting that this included the students in the mathematics in ways that Teacher A's presentation of the vocabulary did not. Candice also suggested that Teacher B could be including rigorous mathematics in his lesson later:

Candice: I think teaching could be like that [including explorations of geometric shapes], especially if we allow them to explore, like show them different buildings and like and different things like that, or give them those experiences like at museums or zoos or whatever. But I think a lot of times, teaching is just like the definition in isolation or the skill in isolation and not. Because we're talking about rigor at our school and how to allow them to create and synthesize and analyze, all those higher level thinking and like a majority of the things that we do are lower level thinking

skills. Even though in the younger grades, it seems like we should be able to still allow the students to practice those, those higher order thinking

Jill: Right, so, okay so using even the word rigor for Teacher A and Teacher B, or in the so, and when you said rigor then you said higher level thinking and synthesizing like applying

Candice: Those are like the highest level

Jill: Right, so where is Teacher B doing or not doing that, giving them opportunity to do synthesizing and stuff?

Candice: It might happen later when she says, "Let's look at it today." Like if she allows them, like if she or he teaches them a concept and then allows them to, find where it would work in the world or in society or think of a, a, like think of a counter solution or think of a solution or some kind of way like creating or applying the knowledge. Application is one part of it, but if they go, like, if they go higher they can create it then have someone else solve it or something like that. (group discussion, May 11, 2010)

Candice emphasized that the way teachers teaches, in addition to the information that they seek to convey, is important. She critiqued the mathematics teaching of both teachers in relation to rigor but emphasized both the content and methods of teacher instruction. Her comment includes elements of rough draft talk (Horn & Little, 2010), which may suggest how she was uncomfortable with the mathematics in this example. She described how teachers could include activities that incorporate higher-level thinking

into their mathematics lessons, and specifically, how Teacher B could do this in the lesson that is presented. Candice identified how Teacher B has options in how he positions the students in relation to the mathematics and emphasized providing students access to opportunities by including rigorous mathematical thinking.

***Distinguishing between how teachers are positioned and how teachers engage with students (Session 3).*** The lessons and interviews with Teachers A and B served to open opportunities for PSTs to discuss mathematics as well as how teachers are positioned in relation to social discourses about learning and students' abilities. I prompted PST to think about how the *teachers* are positioned:

Jill: What do you think is influencing, is there a larger view here that is influencing their own beliefs, like a larger discourse that is kind of pushing these ideas on them? Like I wouldn't say that these two teachers are that unique with, with these ideas, right?

Laura: It's like, something I was going to say before you said that is that we would probably also judge them differently once we knew the demographic. Like that would also influence, you know, how, if we thought their expectations were okay—

Jill: So

Candice: Well, that's saying that your kids at check-out girls at any level—I think is kind of like...

Jill: Problematic?

Candice: (nods)

Jill: Why?

- Candice: On many levels
- Melanie: Especially, like he's at an all girls' school and obviously has a very negative opinion of girls!
- Jill: Of girls. Right, so he has this view of girls being like
- Candice: He said girls. He could have said young ladies or something like that. Even the girl, it's
- Michelle: Check-out lady
- Candice: Check-out *girl*
- Melanie: Yeah, like, he really
- Candice: It's derogatory, I think. You see a check-out girl and you're like  
(head side to side) (group discussion, May 11, 2010)

Laura suggested that the demographics of the school position teachers in particular ways and then teachers react and position their students in certain ways, responding to prevailing discourses about kids; for example, some teachers in struggling urban schools may position their students as incapable or not needing math. She did not say that she supported deficit perspectives of students<sup>18</sup> or felt that Teacher B's expectations were appropriate, but rather she identified that this expectations may be in response to how he is positioned and his context and that Teacher B's response aligns with current social discourses about students (as also reported in research in teacher education, e.g., Sleeter, 2008). Laura's response was similar to the response that Candice provided during our conversation about Mr. Jones when she suggested that his low expectations of his students were an unconscious reaction to their race or class.

---

<sup>18</sup> In her interview, Laura was very clear that she had high expectations for her students in mathematics and how she did not appreciate Teacher B's low expectations for his students in mathematics or for their career opportunities (interview, July 16, 2010).

Candice reacted strongly, not initially to what Teacher B said, but rather how she interpreted Laura's comment as excusing Teacher B because of his context or how he was positioned. Across the seminar, Candice did not criticize teachers because of their positioning, but she did not accept that teachers should *act* in accordance with how they are positioned and, for example, teach or position students in a manner that reinforced these understandings. Consistent with Pollock (2008), Candice expected teachers to reflect on their actions and reposition themselves in relation to prevailing discourses, particularly about providing all students with the opportunities to learn mathematics.

It is interesting that while Teacher B and Mr. Jones' comments are very similar and both demonstrate low expectations of students and their abilities<sup>19</sup>, Candice reacted differently to the low expectations in Teacher B's interview as compared to her reactions to Mr. Jones. The analysis suggests that when there were opportunities for Candice to understand the racial and socioeconomic background of teachers or students or the social context, she identified that teachers are positioned by these dynamics and described that their subsequent positioning of their students may be without malice or intention. The details about the changing demographics of the school population in the Algebra for All vignette, for example, supported her in understanding the teacher's positioning. Candice

---

<sup>19</sup> Teacher B projected low expectations of his students and suggested that they would not use the mathematics that he was teaching them:

They have an idea 'I'm never going to need math in the future because all I want to do is selling or be a check-out girl.' That is fair enough, but they don't realize that math is important to them making sure that they're not cheating the customer or, if they are the customer, they're not cheated. (de Freitas & Zolkower, 2009, p. 197).

Teacher B's comment is very similar to Mr. Jones' comment from the more detailed vignette about Algebra for All:

I have trouble with what the state wants us to do. I think it will be very harmful. Not all kids are capable of learning algebra, just the lower level skills. It's harmful to their self-esteem to force algebra on them. Take Rojelio, for example. He's a kid in my class, very average. This kid probably isn't going to college. It's unfair to make him take Algebra 1. He's never going to use it. (Crockett, 2008, p. 26)



used prevailing issues of race and class as a lens to understand Mr. Jones and how he *felt* like he was “concerned” or Algebra 1 is “unfair” (Crockett, 2008). Without Teacher B’s background or information about the students or school context, Candice did not identify his comment as an act of everyday racism or use prevailing discourses of race and class as a resource to understand his positioning. In this way, she responded differently to the contextual elements of the vignette. Across her response to these vignettes, however, whether she examined teacher’s positioning or did not, Candice did not ignore or excuse the *implications* of teachers’ actions.

Candice’s strong reaction to Teacher B and also Laura’s comment spurred a conversation about the details of Teacher B’s comment and its implications on students. In particular, Candice did not accept the suggestion that Teacher B’s students actually said that they will be check-out girls and that Teacher B is merely repeating what they said. She also felt that teachers’ impressions of their students were suggestions that their students pick up on, and therefore, comments such as Teacher B’s can be harmful.

PSTs also discussed Teacher B’s comments in relation to goal setting. Taylor and Norah emphasized that students should have their own goals, and Laura said that she would respond differently to a student about their hopes of becoming a football player depending on the students’ age (group discussion, May 11, 2010). She felt that the goal of being famous was unrealistic for a tenth grader, but not necessarily for an 8-year old. Although she would tell both students that math is important, she did not clarify how her responses to the students in relation to mathematics and its importance were different depending on the student’s age. Candice responded, normalizing the problem of students’ dreams. However, she did not agree that a teacher’s response should be limited

to emphasizing a generic “need” for mathematics or to providing students with what Laura called a “reality check.” Specifically, Candice said:

Candice: I think that kids should have dreams and different things like that but I think that kids should also have direction and when you, I think peoples' impressions of them or their suggestions towards them. It impacts them and the things that they say about them. Like they go back and think about, “Oh my teacher said that I was a good this,” or they said, “I was a good that.” And then you go back, and they start, because you have to go to college with some kind of goal or some kind of idea because you have to go towards something, even in high school. You have to have a goal to reach and even if those are small goals. Um, it seems like kids, that are, or people of you know like, how sometimes, most of the time, people follow what their parents do, I think they need some kind of expectation, either to live up to, or you know, some people live down to expectations. So I think that starts even when you're young, like with dreams and goals and things like that. So you, I think that you have to go through life with some sort of focus, so we should probably start preparing them, even if that's not what they do. They can change when they're 25 or even in college but we, they should have some kind of goal, not just to like work at a store, even though I mean that would be great, but really, that's not great. That's not a great profession.

Brooke: No, that's a perfectly fine job.

Candice No, it's really not, like you can make minimum wage. Do you know what it's like to live off—

Brooke: No, it really is. You can make good money, you can get benefits. Like working at a grocery store is a perfectly respectable job and if kids want to do that, I don't think that you have any right to judge it. Like, yeah we want to open possibilities to them, but who the heck are we to judge them if that's what they do in their life?

(group discussion, May 11, 2010)

Candice recognized that students have dreams but emphasized the teacher's role in providing direction and expectations and in engaging in practices that prepared and allowed students access to opportunities. Candice's response was consistent with Principle 1 and treating all students as competent and capable. She embedded her principle of antiracism in education by identifying how students are positioned and practices that teachers can engage in to reposition students and allow access to a range of careers.

I align Candice's practices with another principle of teaching response: *Principle 3, Responding to students*: Teachers need to provide all students with access to opportunities to learn. Candice's discursive moves suggest that it is not as much about the actual goal but the importance of teachers understanding the gravity of how they impact students, and the direction, preparation, and support they can provide. She broadly identified that teachers' impressions of students matter for how students see themselves. Candice also emphasized that teachers should take an active role in

repositioning students, highlighting the importance of what teachers say to students, how goals can serve as benchmarks for students, and how teachers need to prepare all students. She described classroom strategies in order to treat students as capable, competent, and worthy and the manner in which teachers can then address students and provide direction. Candice added specific actions, such as how teachers can detail students' strengths and help them set meaningful goals, and how these actions influence students, such as how students reference teachers' suggestions. Candice specified how students may be setting their goals, identifying how some students may follow their parents or live down to expectations, which are not the ideal responses or what she would like to see happen. She recognized that students' goals can change, but insisted that teachers should provide focus, direction, and preparation. In this way, Candice unpacked both principles and strategies in response to Laura's comment.

Candice also specifically identified the teacher's role in setting expectations as an issue of race or class and everyday antiracism. She identified particular students as "kids, that are, or people of, you know, like, how sometimes, most of the time, people follow what their parents do" and suggested that parents' professions may not be career paths that students *should* follow. The manner in which she seemed to struggle to describe this group of students reflects "rough draft talk" (Horn & Little, 2010, p. 195), suggesting that she was uncertain of what words to use and struggled to articulate socioeconomic class. More than Brooke or Laura, Candice was comfortable making a value judgment about working in a store as "not a great profession" (group discussion, May 11, 2010). She felt that this should not be a student's goal, and teachers should encourage students and prepare them for other careers. By identifying first a particular group of students that

need goals and then making a judgment about being a check-out girl, Candice identified and specified the possibilities for repositioning students in relation to their parents' occupations specifically and as in contrast to providing simply a general direction. Candice did not accept that teachers should simply listen to students' goals of being football stars, but suggested that teachers should take an active role in moving students towards desiring other goals and in preparing them. She described opportunities for teachers to reposition themselves in relation to prevailing views of students as incapable of particular careers or incapable of setting and understanding long-term career goals.

*Specifying the influence of the hidden curriculum and describing teachers as repositioning themselves and their students (Session 3).* Candice did not respond immediately to Brooke's contention that being a check-out girl is a "perfectly fine job" (group discussion, May 11, 2010), but as the conversation continued, Candice emphasized not only how she thinks teachers should position themselves, but also the ways in which she is repositioning herself:

Candice: It's just so funny like, okay, I guess we can, we can only inspire so much, and then if they're just hell bent on becoming a check-out girl, you're just like, alright like do that for two years and figure out how hard you have to work and what a terrible job that really is-

Brooke: It might not be!

Candice: Because I did do that and I was just like that is not something anyone aspires to be. That's what I have to—

Brooke: But people do, like people do, Candice.

Candice: I don't think. Ah, okay, that's not in my experience

Sarah: Immigrants coming to this country wanting a job—and will take any job that they can get, a lot of times. That's how those positions are filled. It's not middle class women filling those jobs. It's not.

(group discussion, May 11, 2010)

Candice reiterated that being a check-out girl is not an easy job or one that students should want. She described her personal experience with working at a grocery store and how it is not something that “anyone aspires to be.” From her own experience, Candice suggested that teachers need to inspire students to do more because the *job* is not one that people *aspire* to do.

Brooke turned towards Candice and Sarah and introduced her stepmother. Her tone and description suggest that she felt that she would be able to trump Candice’s personal experience and the way in which Sarah defines people who work at grocery stores as immigrants and not “middle-class white women.”

Brooke: So, let me give you an example here. My dad's wife is, has worked at Safeway for 25 years as a cashier. She loves it

Candice: How did she start at Safeway, though?

Brooke: She's college educated, she's college educated. She is an incredibly intelligent person, she's an incredibly social person, she does it because she makes good money, and she has benefits, and she does it because gets to talk to people all day and be social and work on those things that she really likes to do. She gets to, you know, do cash all day, and she gets to use math. She likes it so

she's been doing it for 20 years and she gets great benefits and good pay.

Jill: I wonder if that's she'd aspire-

Norah: Brooke, I think, but Brooke, I feel like she might be an exception

Candice: Right. How'd she get into that?

Norah: to the rule of people who work at...grocery stores.

Brooke: But I'm saying—

Jill: Your point is that you can't

Brooke: My point is that you can't like, stifle people if that is what they end up wanting to do. Like, you have to open all these possibilities and if that's where they choose to go, then that's fine.

(group discussion, May 11, 2010)

Brooke described her stepmother's work and the positive elements of her job but did not address Candice's question of how she started there or questions about individual's aspirations for particular jobs. Brooke emphasized that "you can not stifle people if that is what they end up wanting to do." This was not what Candice (or Sarah) described as the issue. Candice suggested that teachers need to push against the expectations that students set for themselves by emphasizing students' strengths, encouraging different careers, and preparing them for many possible opportunities.

As the discussion continued, Candice's specific emphasis on everyday antiracism in education was clear in her response to Taylor. Norah and Taylor suggested that the teacher's job is to present opportunities for students to become familiar with different

careers. Specifically, Taylor described an example of a teacher who gave her students different jobs in a school play:

Taylor: They all had different jobs in the play, and it gave them different opportunities to do lighting or to do whatever, and it, it, highlighted their talents and the things that they could do really well in, and it opened their eyes to all these professions. And now they're all great people but you know it's opening their eyes to the positives that they have.

Candice: I think the background that is definitely what I'm thinking is more like the hidden curriculum, like when we read that article about the hidden curriculum and how certain people are like socialized into certain roles as far as society and with opportunities and jobs and thing like that. So I think that that's where I'm going where you don't aspire to do something like that. I mean, even, coming from a background where probably the majority of people around me had like blue collar jobs like mechanic and stuff, like I totally respect them but that is not something that they aspired to be, that is something that they ended up doing maybe because they had a kid or had to have a job to support themselves or whatever, but that's not something they aspire to do, that's not something they thought they would do. And then and then a lot of times I guess people were like, "Oh, you're going to do this, you're going to—." I guess it was always like you're going to do a little bit better because and I



think it was more like having a leadership role and maybe like having a different impact on society type of thing. Like you want to aspire to do something bigger, like to impact someone more than just yourself. (group discussion, May 11, 2010)

Taylor suggested that students should have opportunities to see the different professions that are available to them. In response, Candice clarified that this is not her issue with Teacher B, his low expectations, or the “check-out girl” comment. She highlighted how social norms and discourses, not classroom projects, restrict students’ opportunities and how students perceive these opportunities.

Candice attended to the teacher’s responsibility of providing access (Principle 3), and she specified how the hidden curriculum presented itself in schools and in communities. Although students are socialized into certain jobs, Candice emphasized that teachers should present their students with goals and aspirations beyond what society dictates or the “hidden curriculum,” and in this way, teachers can contest how students are positioned. She made a distinction between exposing students to what different professions are available, which was Taylor’s idea, and encouraging students and even repositioning students as capable to do different jobs. Candice described teachers as having influence over what students “aspire” to do and specified what high expectations looks like and actions teachers can take, such as presenting students with the possible options. In this manner, Candice identified that students’ aspirations are defined by both what they want to do *and* what they see as possible.

Candice was reflexive about her positioning, using her experiences as a member of a blue-collar community as a resource to explain how low expectations can play out in

a community and how her teachers' high expectations mattered for her own goal-setting and success. Candice suggested that her teachers, contesting the hidden curriculum, repositioned her in relation to prevailing discourses of racism and classism and that she can do the same. Candice specified her teachers' comments on the level of specific classroom actions, and her inclusion of her own experiences served as an example of the actions teachers can take in order to influence students' goals and have high expectations. Candice articulated that she can actively work to support students' goal-setting and their achievement, and in this way, she repositioned herself in relation to teachers who follow the hidden curriculum or do not contest how some students are socialized into particular roles. Candice described practices that she can engage in to "unfix the identity" (Ellsworth & Miller, 1996, p. 253) that is attached to students and how she has agency in shaping herself as a teacher who does this.

***Summary of Objective C.*** Across the episodes of this objective, Candice identified how teachers are positioned by discourses of mathematics, social and political discourses of students' abilities (or lack of abilities), and race and class. She described the implications on teaching and more specifically, the implications of racism and classism in relation to students' goals and access to opportunities to learn. She described teacher practices that both conform to and contest prevailing discourses of race and class and that can support teachers in influencing individual students. That is, Candice detailed her own classroom practices, describing how to reposition students, and she also repositioned herself, which suggests shifting understandings of self as mathematics teacher. She also emphasized two principles of teaching response, Principles 1 and 3. In the episodes in this section, particular in relation to Teacher B, Candice problematized

her own positioning and her teaching in relation to a principle of everyday antiracism more clearly than when she only used the phrase “high expectations” in relation to Mr. Jones, for example.

**Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.** In this section, I focus on how Candice analyzed teaching decisions as related to principles of practice, particularly Principles 1, 2, and 3. She demonstrated this objective through her talk about her own practice in Session 4 and how she described her work with a particular student, Javon. Candice problematized mathematics teaching by taking up problems of practice, specifying teaching practices, and generalizing to principles.

*Problematizing student responsibilities and teacher expectations as related to students’ contexts and access to opportunities to learn (Session 4).* In Session 4, we discussed PSTs’ classroom artifacts, such as lesson plans, student work, or reflections that they could use in analyzing their practice and student learning outcomes. I designed the discussion of artifacts to situate PSTs’ conversations about themselves as teachers in their own practice and to support PSTs in connecting their practice to students’ learning. During this session, Candice problematized teaching, connecting Principles 1 and 2 to strategies and actionable steps and engaged in the discursive practices of specifying, revising, and generalizing.

In the beginning of Session 4, PSTs wanted to discuss their portfolio and presentation of standards, particularly the standard “Parent relationships and communication” (Appendix A). Brooke and other PSTs discussed parent communication and parent involvement, but the conversation was characterized by complaints about

parents, such as Brooke's comment that "we tell these parents things and nothing ever comes of it" (group discussion, May 18, 2010). PSTs engaged in normalizing moves, such as griping about parents, that turned the conversation away from parent-teacher relationships as a problem of practice or strategizing about how to understand parental involvement as related to issues of power and knowledge in schools. The discussion about parents led to discussions of homework, in which some PSTs offered strategies for including parents in students' homework, such as translating homework or getting parents' signatures on homework. Horn and Little (2010) suggested that strategies such as those offered serve as categorical advice and they normalize a problem and do not foster further conversation or problematizing. In this way, the group did not take up problems around parent communication, parental involvement, or homework as problems of practice.

In response, Candice problematized practice in different ways than the other PSTs because of the ways in which she situated her classroom practices in principles. She shared a particular story from her classroom and what it meant to her about teaching all students:

Candice: I think that [parent-teacher relationships] is a dual relationship and it's a very sensitive relationship. Like it's part, it's kind of like the parents, it's kind of the teachers and it's somewhat the students because we can't make them do the work. We can teach them as much as we want and we do have to teach them a certain amount of responsibility. Like at my school, I think that we give them a little too much responsibility. Like regardless of, if you're at home

by yourself all night, you have to get this homework done. I don't care if you barely ate dinner last night or you didn't have electricity, you should go get a flashlight or something, and it's just kind of like. As a teacher, we should know our students enough to know that. Like I had the toothpaste issue. Like, I sent something home at the beginning of the year in first grade and it was like a cut and paste. And [hehe] I had no idea that kids didn't have like scissors and glue and stuff like that at home. How naïve, I guess. And a little girl brought it back and it was all soggy and it smelled so weird and I was like, "What is this?" and she's like, "Well, we don't have, I didn't have any scissors," so she ripped it. Like, I guess she put her slop on it and she ripped it, so it was all messed up and it wasn't cut right and then she glued it with toothpaste-

[many people gasp]

Jill: Sounds like paste!

Candice: Right, she said, it said paste on it, so I was excited that she read paste, and um, my what's it called, my teacher, who was there with me, she threw it in the trash. And I was like heartbroken like, "Oh, what are you!"

Melanie: Oh, that's really awful. (group discussion, May 18, 2010)

In response to others' griping and providing categorical advice, Candice normalized parental involvement and student responsibility as a problem of practice and not a problem with one parent or one student, and she problematized how student

responsibility relates to students' work and her principles of everyday antiracism in education.

Candice described parental involvement and communication as a “dual relationship” that is “very sensitive,” and articulated how the responsibility for student learning involved different actors (group discussion, May 18, 2010). She described her school's emphasis on responsibility as falling short of understanding students' contexts and what they can or cannot control in their contexts. Candice felt that as a teacher, she needed to understand her students, their resources and understandings, that is, Principle 2. She addressed the levels of principles, strategies, and actionable steps (Pollock, 2008) and presented her context and related teaching practices.

Candice also made important discursive moves consistent with problematizing. For example, she said that she would have liked to handle the situation differently and specified these teacher actions, detailing how she could have asked students about their supplies before sending home the assignment. She openly contemplated and reflected upon her initial assumption that students had scissors and paste at home, saying, “How naïve, I guess,” and suggested that she would revise her practice now.

Candice identified that her student's response to reading the assignment and how she was able to understand that the student could read the word “paste,” which was important to her. In response to Candice's story, other PSTs discuss the importance of the student's resourcefulness:

- Norah:           She did [her assignment] instead of saying I don't have the supplies  
I'm not going to do it.
- Melanie:        She found things around the house to make it work. Like, that's-

Laura: Yeah, like celebrate that.

Melanie: That's huge.

Candice: You know I don't even know if it was right. You know like it could have been every, like it was a compound word thing, like every single word could have been correct and I didn't even have the opportunity to like

Melanie: Did the little girl see her throw it away?

Candice: Yeah, she was like, "What is this? Uh! Don't come in here with that!" And I was just like, "Give it to me!"

Melanie: Oh, she worked so hard!

Laura: Oh, that makes me so mad because now she feels like, "Why be creative? Why do homework?" And how young was she?

Candice: First grade

Laura: First grade. So there. When her third grade teacher wants to know why does this girl never does homework, well now we know why. Because when she worked hard to use her resources and be creative so that she could do her homework, it was thrown in the trash and treated like that. And that is so upsetting, I just...

Jill: So, we can all use Candice's artifact.

[laughter]

Jill: But, no, but really, it's also, there's a content focus.

Candice: Definitely, like first grade that's like a big thing, like putting words together, you know.

Josephina: The other thing, they should tell us, we should ask before we send stuff. Do you have glue? Do you have markers? My kids are very good in telling you, but mine are third graders, in telling you they don't have something. So that's how I came to know that they didn't have crayons or colored pencils at home, so I gave them for Christmas.... (group discussion, May 18, 2010)

Norah, Melanie, and Laura commended the student for being resourceful. In this way, they highlighted a fourth principle of practice, one that is less about teaching practice and more about understanding schooling. I identify this as *Principle 4, Interpreting school expectations*: To be successful in school, students have to be resourceful and responsible. Candice, however, focused on the student's work and how she would have liked to understand what her student was thinking about the material. Through her focus on the student's work, Candice presented the student as in a complicated situation and capable of not just completing an assignment at home without supplies but completing the assignment correctly. She specified that Principle 1 about treating students as capable guided her practice and Principle 2 supported her in understanding how this student had unique resources for completing the assignment and perhaps for presenting her understanding of the material. In this complicated relationship with parents, students, teachers, and homework, Candice suggested that responding to students' resourcefulness alone or supporting students in aligning with school expectations (Principle 4) did not capture the entire problem of practice. She emphasized that students are accountable for their own learning and the importance of teachers attending to student's learning. In this way, Candice problematized teaching by specifying an example of how she would have



responded to students and how complicated the situation is in her school context.

In response to PSTs' voiced concerns at the beginning of this session about their portfolio project and their concern about what artifacts to talk about, I introduced how this artifact could be an important reference point for Candice. It is interesting that at this point and during the rest of the session, the portfolio project was not discussed. Also, Josephina's comment was not taken up in the conversation, and it is noticeable that others are not attending to her comment or the advice. Josephina's advice did not address to the issues that Candice raised about student work or earlier conversations about communication. Candice already noted that she should have asked if students had materials. In sharing her story, she was not looking for advice on providing students with materials, but rather, she was problematizing issues of homework and student accountability within the conversation about parents and communication. Candice created a noticeable shift in the conversation in this session, as the conversation moved away from a "gripe session" about parents or categorical advice to more conversations about teaching and practice.

***Critiquing and problematizing grading practices in high-stakes accountability contexts (Session 4).*** In response to conversations about how to grade students and the use of rubrics, Candice raised a particular tension with grading students in line with curriculum standards:

Candice:       And sometimes kids just need to know that you're going to look at it or that you care about it, and if you just let them know like I don't appreciate this. Or sometimes I tell them like, "You're not dirty. You're not sloppy. Like, somebody took time to make sure

you're clothes are clean and everything, and you should reflect, everything that you turn into me should reflect how you are.

You're not a sloppy person. You're not dirty.” You talk, you know it's just like, connect to them on like whatever level they're on.

Like, in first grade, they understand like, I don't know, whatever they understand, just connect it back. And as teacher, sometimes that's hard because you don't know if it's like their best, or, like I've found it difficult to judge their work and like assess it. I'm not sure.

Like, I know you're still learning to write, but you're supposed to be writing sentences, and it's just like the curriculum and where they're supposed to be and where they are is. Like, I don't want to break their pride or your spirit or anything, but also I want to get you where you need to go. So, just that balance, and I know a lot times home life and all that connects with that so, it's just like.

Jill: So, want to show them that you care, but at the same time, you don't want

Candice: I don't want a kid to always get a 1. Like, you know, it's this big thing if you're not a one kid. You want to be a “ten boy” or a “ten girl.” But if they're not doing ten work, but they're trying their— Like, it's a ten for them, but it's not a ten according to our rubric. And I actually had a conference about that because I was giving out too many ten's. And like, “Do you really think this is ten work? Like on a BCR, you have to do this, this and this,” and I was like,

“Okay, that was his ten,” and I, he put forth effort, he sat next to me and he tried, so I don't give him a ten on his best try? So, why would he try again?

Brooke: But see what we do is we give, we have star, smiley face and checks. And because we're primary, and we don't give out A's, Bs, Cs-

Candice: Same here, it's exactly the same here.

Brooke: We do have that flexibility. So I use that a lot. So, I, well, kind of for the kids I know are not meeting the expectations of the class, but are really trying their best, they'll get a mixture of smiley faces and stars, star being the highest, because I want to affirm that, but I also want them to know that they need to keep going and what they're doing isn't perfect yet, they should just keep working as hard as they can, just like an on-grade or above-grade level student should be pushed the exact same way. Like, they should be encouraged but they should also know that you know there is always room for growth, and you keep moving forward and you keep learning new things. (group discussion, May 18, 2010)

Candice described ways of caring about students and how she would like to students to understand themselves as competent, capable, and worthy as related to Principle 1. She detailed the particular practices that she enacted in relation to this principle, and less clearly, she outlined a strategy: “Connect to them on, like, whatever, level they're on.” Candice illustrated how she understands curriculum pacing and her role of providing

students with access, Principle 3, but the ways in which this is in tension with Principle 2. That is, as she understands her students as individuals and with individual resources, it is difficult to measure them against set standards.

She identified that there are challenges with understanding student differences and caring for her students while also evaluating student performance and meeting curriculum standards, that is, tensions between embracing a principle of understanding her students as complex, capable, and worthy and rejecting false notions of difference *while* supporting students' standards-based achievement. She problematized evaluating students' work and whether it is "their best," placing these concerns within the context of the conversation about assessment. Candice specified the problem when she emphasized the importance of standards and her work in getting students "where [they] need to go" and placed these goals at odds with supporting a student's spirit. She also described grading students on a scale from one to ten, where there are set requirements for "ten work" and she emphasized how there is a difference between "a ten for them" and "a ten according to our rubric." Candice articulated how the grading system and related institutional pressures dictated how she evaluated students and how this did not allow her to grade students on their effort or encourage them to try again. She supplied specific details to describe the problem and her actions, which opened an opportunity for more explanations for the problem (Horn & Little, 2010).

In this manner, Candice took up the problem of assessment, questioning how to assess different students against the same standards. She identified that supporting all students to do their best is more than a challenge of their motivation or accountability but is also an issue of what is "best" and who is judging students, specifically describing how

there are “false notions of difference” (Pollock, 2008, p. xx). Her description of practice gives meaning to her earlier use of the idea of “balance” and how she struggled with balancing standards, grading, and respecting students’ differences in her classroom. In problematizing assessment, Candice identified tensions with particular classroom practices of grading, specifically, questioning if she can recognize student differences, actively treat students as equally worthy, complex, and capable, and also can grade students on the same scale. Candice illustrated the complexity of teaching and grading students, particularly the institutional constraints on teachers’ flexibility with assigning grades and her desire to align her practices with Principles 1 and 2.

Brooke responded to Candice’s problem by describing the grading system in her context, and she suggested that the “flexibility” that they have in her school context responds to Candice’s problem.<sup>20</sup> However, she did not describe practices that responded to all of Candice’s concerns. For example, Candice described how a student’s work was “a ten for him.” Applying Brooke’s solution would mean giving the student a star for his effort, which may support the student’s “pride or spirit.” Candice, however, also questioned what “ten” means when students are at different levels or understandings. In this way, Candice sought to understand how to grade students’ abilities in relation to a static grading system and she questioned what to do in relation to both objectives and effort.

***Problematizing evaluating and reporting student progress (Session 4).*** PSTs continued to talk about evaluating students’ work, and Sarah shared a strategy for communicating with students about their work. She described how she allowed students to read her written comments during their morning work time, thereby giving students

---

<sup>20</sup> I analyze Brooke’s comments in detail in Chapter 5 in the discussion of Brooke.

opportunity to reflect on her comments and also ask her questions<sup>21</sup>. By supporting her students' continued reflection on their work, Sarah presented assessment as an ongoing practice of actively attending to student thinking, and she described principles of assessment, a strategy of how to enact this in her classroom, and the particular actionable steps she took within the context of her test-driven school culture. This conversation was significant for how Sarah demonstrated her developing positioning in relation to assessment, and it also created an opportunity for other PSTs to think about assessment, as evidenced by further conversation.

Norah agreed with Sarah's strategy and specified how her strategy can encourage students to appreciate teacher feedback. Candice interrupted Norah and worked to fit Sarah's strategy into her own practice: "Do you allow the kids to redo the work after?" (group discussion, May 18, 2010). Candice asked a specific question about Sarah's practice; across sessions, when opportunities arose to ask these kinds of questions, Candice consistently did. Through her questioning, Candice provided opportunities for Sarah to elaborate the problem and her practice, which Horn and Little (2010) defined as positioning the problem teller with "substantial agency" (p. 192) in describing the problem and working out how to respond. In this way, Candice and Sarah together encouraged more discussion around assessing students and communicating progress. Candice's discursive move is important because it highlights how she sought to turn Sarah's strategy, which also connects to her principle of seeing students as capable and worthy of attention, into actionable practices that she can engage in her own classroom. That is, her specifying questions support her own mathematics teaching.

---

<sup>21</sup> Sarah's full comment and my analysis are in Chapter 6 in the discussion of Sarah.

In response to allowing students to redo their assignments, Sarah described how most students earned a high score because she was monitoring their work throughout the writing process. Laura identified a tension in this practice, concerned that students may have the same grade on an assignment, even though they have had varying levels of assistance or were not capable of the same work independently. Candice articulated a different tension:

Candice: It's the same way. Like one of our, in first grade, you grade them like, smiley face, happy face, how, by how independent they are. So, like if you have to help a child a lot, and he comes out with a great product, I can't give him a five or I can't give him a ten because I helped him on so many steps-

Brooke: It's "With assistance."

Candice: Right, that's like

Laura: I've seen that on report cards.

Candice: And, it's like really, this is school, so shouldn't they all have assistance, if they need it?

Brooke: Not unless they deserve it. (group discussion, May 18, 2010)

Laura expressed concern over the differences between students' abilities and how the grades may not capture this when students are given assistance<sup>22</sup>. Candice was concerned that she cannot give a student who has been given assistance a high grade. Across these episodes, Candice was not concerned with standardizing grades, and rather, in alignment with her principle of "rejecting false notions of difference" (Pollock, 2008, p. xx), she

---

<sup>22</sup> I include further analysis of Laura's comment in Chapter 8 in the case of Laura.

questioned and repositioned herself in relation to the institutional emphasis placed on standardized grades and the “With Assistance” designation.

Candice identified tensions between with the grading system, grading practices, and Principle 1 of supporting all students, and understanding students as individuals, Principle 2. Brooke did not problematize this statement in the same manner. She identified the Eastern County reporting system of “With Assistance” (Appendix M) and her grading practice, but this did not respond to the tension that Candice identified.

Laura clarified how her concern is about students’ level of independence because her goal is for students to work independently: “As they get older, they need to be able to do things independently. That's where we're trying to get them all” (group discussion, May 18, 2010). Both Brooke and Candice verbally agreed, and then Brooke offered advice:

Brooke: You have to find that line between honest and supportive. Because if you're, like if a child's not doing it on their own, you can't give them like the highest grade every time because then when they get to the next teacher, the next teacher starts giving them W's [With assistance] instead of I's [Independent], the parents are going to be like, “What is this teacher doing?” Well, no, the other teacher inflated their grade, and like, wasn't giving a true estimate. So I think that you have to be honest with parents and say, you know, “Okay we're helping him here. Let's figure out a plan that we can get them to I's on their own so they have that achievement. It's not



the teacher helping them have that achievement, they have that achievement to celebrate.

Melanie: It's just subjective. And you know, no matter what we do it's subjective. Everything, if we all had the papers, the same kind of list and graded, we'd probably come up with like ten different grades because what I think is a success, could, you know, and that's going to happen year to year, and I agree we don't want to balloon them up to this point, when we know, but

Candice: And at what age? Like, is that important, is that important in like first grade when they're learning letters and sounds? I mean, they can't put together a complete sentence is different than not knowing all of your letters, I understand that, but at what point do we give the judgment? They're out of control. (group discussion, May 11, 2010)

Brooke's advice about a "line between honest and supportive" did not operationalize Laura's concern for consistency in her practice and her search for actionable steps.

Melanie questioned Brooke's emphasis on a "true estimate," describing grades as always subjective, and she literally threw up her hands when she said, "It's just subjective."

Candice asked specifying questions, thereby moving the conversation back to the problem of evaluating student progress. She searched for how to respond to the requirements of grading students when there are both institutional pressures for students to meet particular benchmarks, or the "out of control" judgments, and the reality that students are at different levels. She asked whether grades should be related to students'

grade level or the particular benchmarks. More than others, Candice questioned standardized grading systems and the ways in which they define teaching and suggested that they are in contrast to principles of teaching response and principles of understanding students. She continued to problematize practice, even as Melanie defined grading as inherently subjective and Brooke rationalized her practices based on her school's report card.

Brooke responded to Candice, specifying her grading practices and the institutional pressures and particular norms in her mentor's classroom that regulate them:

Brooke: And then you think of all the bad grades a kid can get. Because on our report cards, if we have a student who "Needs Improvement" on like eight of twelve areas, not even like "With Assistance," but like "Needs Improvement," she'll only give two "Needs Improvement," even though it's in no way accurate of where the student is because it's not tangible to a parent. A parent can't say, I need to work on all of these various things and I have idea where to start. So it's like-

Candice: It's not a true assessment anyway.

Brooke: Yeah. So, even though I don't agree with inflating, we do it automatically because there is no way that one parent can-

Norah: But that just seems backwards to me because then you're going to have parents who go, "Oh, so two out of twelve things he needs improvement on? He's doing fine." I feel like that would be the attitude and it'd be like, "Are you going to help with those two

areas?" Sure, but your overarching attitude, is going to be like, "Two out of twelve needs improvement? Okay, like I'm okay with that." Like the parent that's okay with the kid getting Cs with assistance or whatever. Sometimes I feel like, yeah, like, it's political. Like, can't you say, your kid needs improvement in eight out of twelve areas? Then your kid needs improvement in eight out of twelve areas, and the parent needs to know that.

Melanie: I don't think that it needs to, I don't think that that needs to be on the grade card. I think that needs to be a phone call and say-

Norah: Well, right, that's the problem

Melanie: Let's come in and let's talk about this because. You don't even have to bring up report cards. These are things that I'm noticing in school. You know, we're a team here. Let's see what we can do to really help your child get to the next step.

Norah: Yeah, exactly, I don't think that report cards should go home and be a shock to them. That's not fair.

Melanie: No, that should be something that's happening ongoing throughout the year. I think that maybe we rely too much on it for our communication.

Norah: If a kid needs improvement in that many areas, like, when that report card comes home, you shouldn't be shocked when you see those grades because you should have been getting lots of phone calls from the teacher along the way

Candice: But, is that not a reflection of you as a teacher? If a child needs eight out of twelve? Like, maybe something's going on with the way that it's delivered or something else. Like, I know that I taught one lesson and I was just like, *Whoa*, like this is. Obviously something was wrong with the way that I taught the lesson. And they [other teachers in her school context] were like, “No, the kids just probably weren't listening” or like dadada, and I'm like, “No it's okay, I like can take it, like, I will take that. I know that, if one or two people maybe, but like seven or eight out of fifteen, then there's a problem

Brooke: You also have to-

Candice: I need to reassess my learning, my teaching strategies and not the students, so maybe not just say it louder cause—it was a book we all read, like don't Just say it louder, like think of a different way—because that way just wasn't

Jill: Was that a book, *Just say it louder*?

Candice: Yeah, it's the title of it<sup>23</sup>. (group discussion, May 18, 2010)

Brooke introduced the specific practice of only marking students as “Needs Improvement” in two areas, even if they also need improvement in other areas. She described how parents can only handle a set amount of information and will feel overwhelmed by too much information about their children. Norah and Melanie identified concerns with Brooke’s practice. First, Norah said that parents need to know

---

<sup>23</sup> Murphy, D. (2009). *You can't just say it louder: Differentiating strategies for understanding nonfiction*. Huntington Beach, CA: Shell Educational Publishing.

all of the areas in which a student needs improvement so they stay informed and so their understanding of their student is in line with the teacher's understanding of the student. Melanie suggested that report cards are not the place for parents to find out about their student's progress, and instead parents need to be informed and engaged in the process of supporting their student.

Candice's concern was about how a student even needs improvement in so many areas. She raised an issue about measuring students that is similar to her earlier emphasis on knowing if a student is reaching a benchmark or not. Candice identified the teacher's role in not only grading and communicating those grades to parents, but how student learning, as related to teacher instruction, related to grading. In this way, she situated both teaching and assessment as elements of access to opportunities to learn and specified how teachers need to provide all students with access to opportunities to learn (Principle 3) and understand them as individuals (Principle 2).

Candice did not identify this as a problem of Brooke's alone. She described her own experience and identified her instruction as the reason for students' low scores. Candice also repositioned herself in relation to a prevailing discourse of blaming the students that was prevalent in her school and took ownership of the problem and her students' learning. She asserted that she reacted to students' low performance by analyzing her own teaching and thinking of alternative instructional strategies. Norah and Melanie explained how they can respond to and communicate with parents about students' low achievement, but Candice focused on her role in understanding students' achievement and the relation to instruction. Candice problematized Brooke's practice by relating assessment to instruction and the multiple ways teachers can take ownership of

their practice, even in a context where there are institutional pressures or classroom norms associated with grading.

In order to support the other PSTs in understanding why she has students who need improvement in eight of twelve areas, Brooke specified that her particular students are different:

Brooke: You have to think about like your inclusion students though. My special-like kids, there are some of them who will never be on grade-level and like, their writing will never, like they don't have the motor skills

Melanie: But they have, but you're aware of that. They have IEPs, they have things-

Brooke: Exactly

Candice: They have goals, also.

Melanie: But if I have a

Candice: Like, are they reaching their goals?

Brooke: Right, but that doesn't change their report card. They don't have a different report card because they have an IEP. Like their report card has the exact same standards as every other second grader in the school. So like, they might need improvement on their writing, they might need improvement on this, this, this, this and this, and you know, you push them, but they're always going to be in a different place.

Candice: That doesn't make sense.

Melanie: Yeah, but with those parents, there is the dialog that I was talking about before. The parents know where they're at. You can be, you're constantly communicating with them, improvements that you're seeing them, and those goals are probably more on what they're focusing on than that report card because they are aware of that, too.

Taylor: And that goes in to the subjectiveness of grades. Are you grading them on what their abilities are or are you grading them on what everybody else can do?

Brooke: And I'll be honest sometimes that it really kind of depends on my mood. Like, sometimes I'll be like, you know, it's just that kind of day that I'm willing to be harsh on everybody which is bad because I know that we should be really consistent, but some days

Norah: But we're human. Like, we're not machines. We can't sit there and cut out the subjectivity and the emotions of the classroom and, you know. It's hard-

Candice: Do people with IEPs, like in an inclusion class, are, they're not held to the same standard-

Brooke: Yes!

Candice: So why would they be judged the same? (group discussion, May 18, 2010)

Brooke described how her grading practice was related to the requirement of completing the same report card for all students and how students' individual differences or even

their particular accommodations do not change this requirement to evaluate all students on the same standards. Candice asked specifying questions about students' goals and inclusion students, seemingly confused as to why all students, even those who have different goals, are measured on the same standards. Throughout this episode, Candice sought to operationalize what it meant in both her context and across contexts to grade students on the same standards when they have differing abilities, and in this case, different goals.

*Analyzing supporting student learning and self-concept (Portfolio presentation).* In her final portfolio presentation (July 2010), Candice attended to principles, strategies, and actionable steps when discussing a student, Javon, his reading abilities, and his self-concept<sup>24</sup>.

In her portfolio, Candice presented a picture of the Kunte Kinte Memorial. With this slide, she said she was “reminded of education [can] transcend any situation. He was a scholar and education is the great equalizer.” Candice identified this principle about the power of education, and then immediately proceeded to discuss what she did in her classroom:

In first grade, I had to provide authentic reading experiences for my students. They struggled with letter identification and sound-letter recognition. I used food labels to place letters and sounds within a context for lowest level reading group struggling with early literacy. The first week of school [I gave] a pre-assessment was a checklist provided by the county [for] kindergarten. All students should know the capital and lower case letters, 100 sight words. Javon, a struggling

---

<sup>24</sup> I was not present for her presentation of her portfolio, but she submitted her powerpoint presentation and the narrative that went with each slide to me.



reader, expressed extreme frustration during phonics, reading, whole group, and small group. I used different strategies, writing on white board, tracing letters with his finger, picture clue cards, flash cards. I later found out the student had an IEP for vision problems and he did not like wearing his glasses. I told him he reminded me of one of my brothers when he was little. I showed him a picture of my brother wearing his glasses. I told him he was handsome in his glasses just like my brother. He informed me he was just not that smart but it was ok.

(Portfolio presentation, July 13, 2010)

Candice made connections between her work with Javon, her emphasis on education as the great equalizer, and a teacher's role in providing access to opportunities to learn for all students. Candice presented Javon as both complicated and capable and described his struggles with reading and phonics as also related to vision problems. Candice's discussion of supporting Javon related to Principle 1, treating all students as competent, worthy, and capable.

The details of her interactions with Javon are important for understanding both her attention to principles, strategies, and actionable steps. Her explicit attention to his struggles with literacy and his self-concept suggest specifying, which is Horn and Little (2010) suggested as a "crucial transition to focused reflection" (p. 194). Candice shared what she did after Javon said that he was not smart:

I didn't respond immediately, but I stopped guided reading group to talk to him about his interests outside of school. He told me he liked candy. I asked him, "What kinds?" He answered, "Kit Kat and Snickers." I bought a bag and emptied them out and gave him a piece if he could tell me what letter it started

with. Next, he learned the initial sounds of his favorite candies. We moved on to spelling the entire word. While enjoying the candy, I explicitly made a connection to the letter sound cards we used in the classroom. He had his own letter cards with names of candies and foods he really enjoyed. I decided to ask all of the students to list and make a personal illustration for each letter. We taped the new letters to our desks and if we ever got stuck, the students were allowed to refer back to their reference on their desk. Javon still bothered me and I had to think of a way to make him feel smart. (Portfolio presentation, July 13, 2010)

In sharing the details of reading group and how she was still bothered after reading groups by his lack of confidence, Candice identified that there are other options of how she could have addressed Javon's comment and her uncertainty. The practices of revising or "rough draft talk" (Horn & Little, 2010, p. 195) are difficult to hear or see in a written work, but Candice's attention to the details of the conversation and her lack of certainty in her own response suggest her continued reflection and revision.

Candice also detailed a specific teaching practice that she designed for teaching literacy. Candice highlighted her teaching methods that did not work for Javon and then described an activity that was effective in her particular context with this particular student. Candice presented her high expectations for Javon when she created an activity that could support his learning instead of labeling him as a struggling reader and not creating alternative activities and supports. She also expanded this Javon-specific actionable step into an activity for all students, which also suggested how she understood operationalizing high expectations for all students. Candice discussed these strategies

and actionable steps specifically, and she maintained her agency in attending to Javon's struggles with reading and his lack of confidence. Candice also included her students' agency in this discussion and in the activity: "We taped the new letters to our desks and if we ever got stuck, the students were allowed to refer back to their reference on their desk" (Portfolio presentation, July 13, 2010). Candice provided students with a resource for their letters and letter sounds, but as this may not have addressed Javon's feelings, Candice was still concerned.

Candice's concern about Javon was more than about his reading proficiency. She also wanted him to see himself as competent and capable and support his self-concept. When Candice told Javon about her brother and his glasses, she was interested in supporting Javon in wearing his glasses so then perhaps this will help him see more clearly and then have success with his schoolwork, but she also uses this as opportunity to share more about her brother, his successes, and her high expectations for Javon:

One day, weeks after I told him he reminded me of my brother, he asked me how my brother was doing. Thankfully, he was in his final year graduating from Cal Poly Pomona. I told him he was going to be a high school math teacher. He [Javon] was very excited to know that he [her brother] was doing something good with his life. Javon was a very insightful and caring child.

(Portfolio presentation, July 13, 2010)

Candice specified both her work with and information about Javon. She suggested that being able to share her brother's successes with Javon was important for encouraging him to wear his glasses and see himself as capable and competent. She presented her brother to Javon as a role model and expressed to Javon that she had high expectations for him.

Candice felt that Javon understood the importance of education, similar to how she saw education as transcending every situation and as “the great equalizer.” This specifying is also significant because Candice presented Javon not only as a first grader who wants to be like her brother, but also as one who is thinking about what “doing something good with his life” means. Candice situated her principle of the power of education in this discussion with her attention to Javon’s understanding of the power of education and how she feels it is necessary to support and foster students’ understanding of education, as well as support them in achieving their dreams and goals.

Candice’s story with Javon became less about reading and more about classroom strategies for supporting students’ self-concept:

When I returned from [my brother’s] graduation Javon wanted to see pictures of himself, my brother, in the future. I showed him and he was really excited. He said, “That can be me.” I told him my brother is very smart and tries his best even when something is hard and he never gives up. He also asks for help when he needs it and always he wears glasses. Although at the time of his graduation I was no longer Javon's permanent teacher, I still managed to make a lasting connection with him. (Portfolio presentation, July 13, 2010)

Candice used her brother’s story as an opportunity to convey to Javon her high expectations for him and share the importance of trying his best, persevering, asking for help, and wearing his glasses. She emphasized the importance of building connections with students and how these connections are more than reading skills. In her attention to the life skills of perseverance, Candice situated her attention to the principle of education as an equalizer in particular practices. Her story of Javon and his glasses presented the

principle of having high expectations in specific teacher practices, including both general strategies and actionable steps that worked for her context. Candice also discussed her own agency by noting that even as an intern, she was able to enact certain instructional practices and supports that were important for Javon.

***Summary of Objective D.*** Across the episodes in this objective, Candice analyzed her teaching decisions in relation to her principles of teaching response and principles of interpreting students, and she identified how these principles were in tension with current practices of grading and evaluating student progress. In response, Candice questioned her own grading practices, other PSTs' practices, and the district-level policies. In discussing her own students and Sarah's strategy, for example, Candice integrated strategies, principles, and actions, in order to create a resource that she can use in her own classroom or to think through future problems. She also proposed practices that align with her principle and described how she worked to reposition Javon both as a strong reader and a competent and capable student.

### **Discussion/Overview**

During the seminar, Candice's understanding of self as mathematics teacher and mathematics teaching were related to prevailing discourses of racism and classism. She articulated the multiple ways issues of racism and classism influence and even regulate students, teachers, and schools. Candice discussed, for example, how racism and classism emerged in Mr. Jones' actions and in the development of arts-based schools. In this manner, she framed issues of race and class in schools as "communal productions" (Pollock, 2001, p. 10), not as related to one individual but as related to positioning by political and social discourses. Pollock suggests that without a perspective of communal

production, “we fail to frame dismantling such patterns [of inequities or racial achievement, for example] as communal responsibility” (p. 10).

Candice identified how she and others are positioned by discourses of race and class, but I contend that she did not let prevailing social discourses of race and class *define* her positioning or that of other teachers. Candice used this awareness and understandings of prevailing discourses of racism and classism as *lenses* to help unpack particular situations, such as how Mr. Jones positioned his students or how the teacher in *The Wire* created activities to teach probability and to identify the ramifications to students. She maintained her attention to race and class throughout our seminar, situating these discourses in classroom practices and as related to teachers and herself as agents who can and should provide students with access to opportunities to learn and to succeed. For example, Candice understood Mr. Jones and Teacher B’s teaching as in response to particular discourses about race and class and did not critique their understandings, but she critiqued how and whether they acted in accordance with these discourses or instead took responsibility to act in a manner that prepared students for higher-level mathematics or provided students with goals and direction, for example. In this manner, Candice took up discourses of race and class and repositioned herself as a teacher in relation to them, thus negotiating and describing how to respond in a manner consistent with a principle of everyday antiracism in education.

As Candice repositioned herself in relation to these discourses and problematized teaching by introducing everyday acts of antiracism in education and principles into her practice, the analysis across objectives and sessions suggests that her understandings of

self as mathematics teacher and her teaching shifted. I identified three principles of practice that emerged in Candice's discussion of practice:

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx)
- *Principle 2, Interpreting and understanding students:* Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning.
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.

Candice problematized teaching in alignment with these principles in different ways across the sessions. In the first three sessions, Candice described the teachers in the vignettes—Mr. Jones in Session 1, Mrs. Carlton in Session 2, and Teacher B in Session 3—as having “low expectations” or “just [not] believ[ing] all kids can learn.” In this way, she emphasized Principle 1. While Candice attended to Pollock's (2008) three levels in her discussion of Angela's reaction to Mrs. Sykes, for example, the discursive practices of specifying and revising (Horn & Little, 2010) were not present, and her attention to this principle was not explicit.

In different episodes of the seminar, Candice applied and situated her practice in relation to Principles 1, 2 and 3, and in other words, shifted to problematizing practice (Horn & Little, 2010) and attending to the interplay across levels of Pollock (2008). For example, my analysis suggests that Candice was problematizing teaching and Principle 1 in context in Session 4 in ways that her earlier strategies in relation to Angela or Mrs.

Carlton did not. She discussed her principles of everyday antiracism in education in these classroom contexts and real classroom interactions, and she operationalized Principle 1 by identifying strategies and classroom practices for example that contested the positioning of students within the current contexts of test-driven accountability. She also detailed what Principles 1, 2 and 3 meant in relation to teacher actions and the positioning, for example when she questioned grading students, understanding student differences, and supporting students' self-concept, and sought to define how to enact practices consistent with her principle of everyday antiracism in education within her context in a test-driven school. Candice's discursive practices around mathematics teaching shifted to include principles, strategies, and actionable steps suited to her context, which suggests how she was problematizing practice.

It is not clear, however, that Candice's understandings of teaching were specific to mathematics teaching. My analysis describes how Candice understood herself as a mathematics teacher and her teaching as related to her school context and the social, institutional, and political contexts, but it is not clear that Candice situated these understandings in mathematics or other content areas specifically. For example, in her discussion of Javon, Candice wanted to engage in different instructional practices, first because he was having difficulties with his letter sounds. But, her discussion illustrated that her underlying goal was to support his sense of self as a reader and as competent, capable, and worthy. Although Candice did want Javon to be a strong student, she saw education more broadly. She defined education as not just reading or mathematics, but as "the great equalizer," and as related to supporting the whole child. Candice suggested that the specific contextual, relational, and performance-related elements of positioning



are important when understanding Mr. Jones or her own students, for example, but she did not describe these as differing across academic domains. Although Candice demonstrated shifts in her understanding of herself and her teaching in relation to issues of race and class, it is not clear that these understandings or their shifting are specific to an academic domain.

## **Chapter 5: Brooke**

Brooke is a white female in her mid twenties. Before beginning ElCert, she worked as a consultant in the private sector. She discussed how a speech by former DC School Chancellor, Michelle Rhee inspired her to teach in an underserved school and chose to begin the ElCert program. In her mathematics autobiography written in September 2009, Brooke said that she never liked mathematics but described her mathematics learning experiences as “not overly positive or negative.”

In her ElCert internship, Brooke was placed in a second-grade classroom in Eastern County. She described her classroom as having a lot of inclusion students, but she did not specify how many. Her mathematics class was “above grade level,” meaning that she taught her second-grade students third-grade mathematics objectives and they were tested on the third-grade curriculum. During our seminar, Brooke presented herself as confident about her teaching and herself as a teacher. Others generally liked Brooke, but some PSTs felt that she was abrasive during the first three sessions and dismissive when talking about her teaching or her students.

### **Analysis of Brooke Across Seminar Objectives**

This analysis, structured by the four objectives, presents how Brooke positioned herself in relation to and was positioned by institutional discourses of test-based accountability and the manner in which these issues framed her understandings of herself as a mathematics teacher and her mathematics teaching, specifically how educational reforms and policies influence classroom instructional practices, teachers’ feelings, as well as teachers’ relationships with students and their positioning of students (Olson & Craig, 2009). Table 5 is a map of the presentation of the case in order to help the reader

*Table 5. Presentation of the case of Brooke by objective and analytic sections*

Objective A	Objective B	Objective C	Objective D
Identifying how accountability pressures influence teachers and describing teaching (Session 1)	Describing teaching vocabulary terms and relations to teachers' expectations (Session 3)	Examining her positioning in her classroom (Written responses after Sessions 2 and 5)	Describing practices of grading student work and engaging discursive practices that move the conversation away from problems of practice (Session 4)
Describing teaching and test preparation in test-driven contexts (Session 1)	Analyzing teachers' expectations in school contexts (Session 3)	Describing her response to and understanding of race in her classroom (Session 6)	Explaining practices of reporting student progress (Session 4)
	Examining the teacher's role in students' expectations (Session 3)		Describing evaluating and reporting practices for students labeled as special education (Session 4)
			Detailing instructional practices and ability grouping (Written reflection on artifact of practice)
			Describing and supporting students' positioning in the mathematics classroom (Revisiting written reflections on mathematics teaching and learning)

follow the episodes that are aligned with each objective.

Across the seminar sessions, the analysis reveals how Brooke's understandings of herself and her teaching were intimately tied to her local context and the institutional pressures she felt. She detailed her practices and elements of her context, and she described her students in relation to the categories that her school used to define students' performance, categories such as "below-grade-level." The analysis suggests that she did not relate her understandings of her practices or her students to the social or institutional dynamics influencing her internship teaching experience. Brooke engaged in discursive moves that turned teaching away from problems of practice, such as offering categorical advice, and she did move towards problematizing teaching in these sessions. Brooke identified practices that aligned with two principles, but these principles did not emerge as salient nor were they consistently related to Brooke's practice or her problematizing across sessions:

- *Principle 1, Responding to students:* When teaching, you have to work towards "rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable" (Pollock, 2008, p. xx)
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.

In order to present how Brooke was not problematizing practice or grappling with the same questions as other PSTs in relation to the institutional dynamics present in their classrooms, it was necessary to present sections of transcript that show both the opportunities for Brooke to problematize practice and her responses. The following presentation of the case presents how Brooke's understandings of herself and her

teaching did not shift across objectives or over the sessions in relation to issues of test-based accountability or issues of the institutional constraints she felt.

**Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations.** In this section, I focus on the ways Brooke examined and interrogated the implicit discourses defining mathematics teacher and in teaching situations in Session 1. Specifically, she identified the institutional discourses of accountability that were present in the *Algebra for All* vignette. In discussing her own teaching, however, Brooke did not relate these discourses to incidents in her mathematics classroom that involved testing or identify how these discourses position her as a mathematics teacher. Across these episodes, analysis suggests that Brooke did not trend towards attending to positioning as contextual, as relational, or in performance, and she did not demonstrate this objective in relation to issues of test-based accountability.

***Identifying how accountability pressures influence teachers and describing teaching (Session 1).*** In Session 1, PSTs read the vignette *Algebra for All* (Appendix C; detailed rationale is in Chapter 3). After reading the teachers' negative comments and resistance to implementing a policy of teaching Algebra 1 to all students, Brooke suggested that teachers in the vignette are frustrated:

One thing that we haven't really addressed is that demographics have changed and that their test scores are going down. And it seems like you've probably got a lot of frustrated teachers that, they aren't getting the same results or getting the same praise from their district, and so they're looking for something to be frustrated at rather than seeing—It's like they want their students to change so they don't have

to rather than changing to meet the needs of their students and get them to that level. I think that it's disturbing. (group discussion, March 23, 2010)

Brooke hypothesized that students' past performance on the standardized tests created expectations for teachers. In a test-driven school culture, where teaching quality and students' learning are equated with high stakes test scores, research suggests that teachers, administrators, and students feel the pressure of the importance of high student performance on these assessments (Cochran-Smith, 2005). One special education teacher in Rinke and Valli (2010) expressed concerns about her students' achievement and the pressures she was under: "It's not going to happen for many of those children. It's not going to happen. And sometimes, you know, that's a source of anxiety for me" (p. 665). Brooke identified how teachers in the vignette may have these same concerns. She empathized with the teachers' frustrations, which suggests how accountability pressures are real to her.

Brooke also connected the changing school demographics to students' lower test scores and teachers' frustrations. Through discussing how these dynamics may frustrate teachers, Brooke assumed that changing school demographics means that there are lower test scores and that teachers need to change their practices to meet the needs of their new students to pass the test and to respond to the current accountability pressures. It is unclear if Brooke distinguished between teachers' frustrations with their students' test performance, their frustrations with standardized testing in the classroom, or their frustrations with the accountability system, that is, its influence on their practice and their careers. The influences of accountability systems also reach deeper than teaching practices or teachers' roles in the classroom. State-mandated reforms involving imposed

standards and curricula and reductive testing lead to ability tracking, lowered expectations of students, and reduced opportunities to learn in particular for children that the policies are designed to support (e.g., Apple, 2004; Valenzuela, 1999).

After our discussion of *Algebra for All* and how PSTs understood teachers' reactions, I asked each PST to write her vision of herself teaching mathematics in five years. During this time, Brooke asked me a question about teaching volume to her students:

Can I ask you something? I'm, I need some help with a math lesson...So, tomorrow is day 5. I'm trying to teach volume [laughs]...They get like the point. They understand, like, the concept of volume. They don't get how to count on flat figures. So, when you look at a 2D object on a piece of paper, and its an irregular, if it's regular they can do it, but as soon as it's like stairs and you can't see the behind ones, then they can't do it. ...We built them for three days and they're just not seeing the connection at all. (group discussion, March 23, 2010)

Brooke suggested that her students “understand the concept of volume,” but there was a particular understanding or skill—counting cubes on flat figures—that they were not demonstrating. Brooke differentiated between concepts and skills and emphasized that she wanted to focus her teaching on this one test-based skill or objective. Candice and Laura asked follow-up questions:

Candice:      What grade is it?

Brooke:      Second graders doing third-grade math.

Laura:      I was going to say, “Why are you talking about my objectives?”

Jill:      So, what's the goal?

- Candice: Is it a 3rd grade concept? Are they supposed to master that at 3rd grade?
- Jill: I don't, I don't know. So, that's the idea, is like—
- Laura: It's like one objective.
- Brooke: It's definitely on their, I hate to say, it's on their assessment. I don't know a lot about the practical of this.
- Laura: I mean, they need to count. There are two pictures.
- Jill: They don't need to know length times base times height.
- Laura: No, there are two pictures and I think that they are odd-shaped. They have to count the cubes.
- Jill: They did build their own?
- Brooke: So, today I had them build, I did it on the screen and they did it at their desk. So, we all built the same thing, but they just. They literally can't see what's behind it. It's like, you know when you're working with an infant and you have a ball and you put it behind your back and they just think the ball is gone, like magically into thin air. They just think the blocks are gone. (group discussion, March 23, 2010)

Brooke identified that her focus was on the assessment and questioned the “practical [nature] of this” or how this test objective related to mathematics outside of the test. She discussed her students’ difficulty with seeing the composition of the figure and made an important step to try to understand why her students are miscounting the blocks. She hypothesized that they did not understand that the blocks were present even when they



could not see them. Brooke, however, positioned her students as infants unable to understand object permanence. This suggests that she did not understand her students as capable of this mathematics. She rooted this deficit perspective of her students in how they were not successful with a particular test objective, which suggests how she felt positioned by the accountability pressures associated with this assessment and understood student understanding as related to test objectives.

This is not meant to be an indictment against Brooke. Research suggests that teachers are influenced by the ways students are labeled and understood by other teachers and administrators in their environment and also by the way mathematics achievement is understood as related to speed and motivation (e.g., Horn, 2007). That is, it is understood that the labeling of students and Brooke's related deficit perspective are not unique to Brooke. Teachers' conceptions of students are also reinforced through school's curriculum pacing and ability grouping systems (Horn, 2007). Brooke's reaction to her students is also consistent with research that suggests high-stakes accountability pressures lead schools focus to and teachers worry about their low-achieving students more, considering them liabilities to overall school and class success (e.g., Diamond & Spillane, 2004).

In response to Brooke's description of her students, Paige suggested students could trace the figures, and Michelle suggested having the students use Jell-O boxes because the unit cubes fit perfectly. Brooke replied that these ideas would not work because her students were "not seeing the connection" (group discussion, March 23, 2010). The "connection" that Brooke was concerned about is how the understandings that students could build through engaging in activities such as building with blocks or

tracing figures related to the particular test objective. She wanted her students to do well on this objective and was searching for a solution to this concern; she was not focused on building student understanding volume more generally. Brooke's emphasis on this lesson and assessment suggested that she felt pressures similar to teachers in Rinke and Valli (2010).

In talking about her practice, however, Brooke was uncomfortable identifying these pressures. In our discussion immediately following Brooke's questions about her lesson, Candice identified how education policy and her test-driven school context had implications for both her current teaching and how she understood her options for where to teach. She described the pressure to ensure that her students met particular benchmarks and felt that her reputation as a teacher was related and dependent on her students' achievement on high-stakes tests. Laura and Michelle identified similar concerns, but Brooke disagreed:

Laura: I imagine myself as a certain, teaching a certain way but recognizing that in certain places I can't do that. I can't have those freedoms. But then I recognize that I am really limiting myself to places, where I can, you know, if I, if it's a priority to me to teach in a way that I want to, I'm really limited to places that are going to give you that freedom.

Michelle: It's also back to what Candice was saying. Like, the test is basically telling you what is important and what is not. So, regardless of what you think is important for kids to know, that's not necessarily what you need to teach or what you'll be teaching.

And things that are on the test, which you think are silly, you'll have to, you have to teach.

Jill: 7/10 equals 1 or whatever

[laughter]

Brooke: But see, I don't feel like that. I don't feel like that influences me all that much because like I'm spending 5 days on this stupid volume lesson, which really doesn't have the huge practicality of counting these imperfect like block shapes, but I'm doing it because it is going to be on their unit assessment. But the majority of the stuff I teach is all beyond what is being assessed on those tests. So I feel like the test doesn't necessarily, like I make sure that I hit those things but it is only like, you know, a couple of things that I need to do and I have a lot more time that I get to do a lot more enriching things with my kids. (group discussion, March 23, 2010)

Laura and Michelle described how the accountability pressures in their school contexts influenced how they taught and what they taught<sup>25</sup>. Brooke discussed her practice differently, first noting that she was indeed spending five days on a test objective and then asserting that she did not feel these same institutional pressures as Laura and Michelle and had autonomy over what she taught.

It is significant that this discussion is less than three minutes after she asked for assistance with her volume less and the emphasis she placed on test objectives. Her differing responses, what some research on identity would call “inconsistency,” aligns with the theoretical framing of identity in this analysis, where identity is multiple and

---

<sup>25</sup> Laura's comments are analyzed in the case of Laura in Chapter 7.

fluid and influenced by context. Brooke seemed comfortable identifying the accountability pressures as related to teachers in the vignette and her specific lesson, but less comfortable, even resistant, to framing her understanding of herself as a mathematics teacher as related to the institutional discourses of accountability and their influences on her practice. She called her lesson a “stupid volume lesson,” dismissing its importance because it was not practical but identified that she was teaching this lesson because the objective is on their unit assessment. In this manner, she identified that the unit test and its objectives drove her instructional choices but did not generalize to the influence that the prevailing pressures of accountability have on her practice. Instead, Brooke described her teaching as including “more enriching things.” This suggests how Brooke did not examine the contextual elements of her positioning or how her positioning by test-based accountability surfaced in her teaching (positioning as performance). It is also important that the idea of “teaching to the test” is not accepted in teacher education coursework and Brooke may have wanted to respond to her peers and me—and have felt pressured to respond—that she is not “teaching to the test.”

I sought to encourage Brooke to identify how some elements of her context, in particular her students’ status as “above-grade-level,” influenced how she was positioned as a teacher and the options she had to teach:

Jill:                Now, how is that, how is that in your situation because there is this prevailing way of thinking that your kids are above grade level right?... What are they? In second grade doing third-grade math?

Brooke:           Right

Jill:                How does that allow you then to not have these same struggles?

Brooke: Well, because—

Laura: I'm teaching the same curriculum but to the lowest, [laugh] I hate to say it third graders, and so we probably see it, very, this exact same curriculum in very different ways.

Brooke: Well, and I think, I think that it's just a matter of how you look at it. I know a lot of the second grade teachers right now are not teaching to the test. You know, they hit those standards but they are really making sure that they are giving a more practical, a more meaningful spin to their instruction and I think that is really valuable. I was listening to a principal speak last week, who was like, you know, once we start scaring the living daylights out of our kids about tests and you know all of the things that they need to learn, it doesn't become about obtaining knowledge anymore it becomes about taking a test, and naturally, they are going to do worse on it. So, I know a lot of teachers at my school focus on you know giving kids a really full understanding of math so they can go take those tests and do well. And that seems to be unique from what I've heard in the program. (group discussion, March 23, 2010)

In response, Brooke emphasized the problems with testing and how test preparation may not support student learning or achievement, but she did not respond to the question about her school context, or specifically, the differences between her relationship and Laura's relationship with their respective students. Brooke dismissed Laura's relational

concerns and how she felt her students' positioning influenced her options for appropriate practices. Instead, she turned talk away from a problem of practice, and suggests that Laura's concerns were simply a matter of perspective.

Brooke also described teachers in her school as teaching meaningfully lessons, which situated the pressures of test-based accountability as specific to in-class lesson design and not related to how students are positioned by the test-driven culture. She did not specify what it looked like to give "kids a really full understanding of math so they can go take those tests and do well" (group discussion, March 23, 2010). Brooke emphasized that test-driven instructional practices may intimidate students and lead to lower achievement, but she did not respond Michelle's emphasis on the how test-driven instructional practices may restrict students' *learning* mathematics with understanding.

In discussing Mr. Wilson and teachers in the *Algebra for All* vignette, Brooke identified how there are expectations for students and teachers and that teachers may feel frustrated when their students do not meet these expectations. She did not identify these same pressures or the role of institutional pressures of accountability systems in teaching; rather, she seemed to *resist* identifying the way she was positioned. Her discussion of her teaching seemingly aligned with these pressures, but she asserted that the political and institutional pressures of accountability systems did not influence her or how she or her colleagues taught. In this way, Brooke was not reflexive about *her* positioning as contextualized, as relational, or in performance, not only because she did not identify these particular influences but because she did not identify other elements either, maintaining that her teaching context did not influence how she was positioned or how she saw her practices.

*Describing teaching and test preparation in test-driven contexts (Session 1).*

Following Brooke's more general comments, Maya redirected the conversation to her current classroom and how she understood the influence of curriculum pacing on her students specifically:

Maya: But I wanted to like go back to when we were talking about the struggles and with the test. I mean, I teach first grade, so we weren't not like at all into like the test. But my biggest struggle right now, in my teaching math is like I have like five or six kids in my class who don't know how count. And I'm teaching pre-place value to the whole class because we do math in whole class. And I know that there are going to be 5 of six kids like [looking around]. And it's so hard. I don't know how to reach them. I don't have time. I have to keep teaching. Every two days we change what we're teaching. Today it's pre-place value, tomorrow it's estimation, and like you have a curriculum that you have to, but they're not improving. And—

Brooke: Can you do centers with those kinds of kids?

Maya: We don't do centers in math. We do centers in reading.

Brooke: Could you do centers so you could reach those kids? (group discussion, March 23, 2010)

Maya highlighted a tension between encouraging student understanding and teaching within a test-driven curriculum. She felt pressured to move through the mathematics material on pace with her curriculum, but she was concerned that all students did not

understand the mathematics. Brooked interrupted and suggested Maya create different activities for small groups of students or do “centers.” Maya, however, sought support in how to attend to the conflict between teaching for understanding and a test-driven curriculum; Brooke’s comment did not specify how to respond to the prevailing conflict or attend to how the curriculum and testing pressures were present in Maya’s classroom and were part of a prevailing discourse of accountability and testing.

Later in the discussion, Candice explained how classroom teaching and standardized assessments engaged students in different mathematics and different ways of learning and being in classrooms. Specifically, she identified that instructional practices that encouraged student engagement in mathematics are in contrast to test-driven assessment practices that do not allow students flexibility in presenting what they understand. She felt that she and teachers across all schools had to assess students in certain ways in order to comply with testing pressures and prepare students for the reading and other demands of standardized testing. In this manner, Candice highlighted another tension between teaching and assessment.

Paige, Taylor, and Norah identified how the formatting of the test is also problematic for students, and Norah described a specific example when students were confused when the question and answer were on different pages or in a different format. Brooke described how she addressed this in her teaching and assessment:

Brooke: But see, when we have, we prep our, like, for our second graders because our kids are going to take the Stanford 10, too. We, we start making our assessments in class match those standardized tests, so that it's not weird when they get there. And it's not



necessarily, like, it doesn't change how we're instructing, it just changes the format that they're answering it in. And we tell them there is going to be a distracting answer or there is going to be something that obviously is not right and then there's going to be a correct answer.

Candice: That's teaching to the test, though.

Brooke: No, but that's teaching them like—that's teaching them how to read a problem. And that's very different than teaching them—Like, you know, you've got to teach a kid, that when you read something, you need to look for things that don't make sense. Like, having reasonability is an important skill in life. Then having, knowing that something is going to be there. Well you need to know that if you read the problem even a little bit wrong there is going to be something distracting there. And I think that is very fair for kids to know if we are going to put tricky things like that on the test.

(group discussion, March 23, 2010)

Brooke explained how she reformatted her in-class assessments to be similar to the standardized assessment and identified this as a solution to the issues that Candice and Norah highlighted. Similar to her comment above about centers, Brooke proposed a solution that did not address the complexity of the tensions between test-driven accountability measures, such as curriculum pacing and standardized tests, and student understanding or the conflict between teaching for understanding through particular instructional practices and assessing student learning through multiple-choice questions.

Through her move of reformatting test questions to match the standardized tests, Brooke emphasized the importance of the test, even as she asserted that the test did not influence her teaching. She also asserted that changing the format of an assessment did not influence her instruction. In this manner, she did not situate assessment as a related element of her instruction or identify how accountability pressures create this dynamic. Similar to Norah, Brooke distinguished between students' understanding of formatting and students' understanding of the mathematics material. She offered a solution to this conflict, a solution that she emphasized as "fair" and supportive of students' standardized test achievement but not as in response to the testing pressures in her school context. Brooke did not acknowledge her positioning in her performance, that is how the reformatting of her tests suggested how she was positioned by accountability pressures and that these practices are what responding to these institutional discourses looks like in mathematics classrooms.

In response to Candice, Brooke seemingly resisted seeing herself as positioned in this test-driven accountability context. Her resistance may be related to her lack of comfort with admitting the role of test in her practices or her lack of understanding of her positioning; whether the seminar did not support her in sharing her vulnerabilities of her practice or she did not see her practice related to testing, Brooke did not identify or specify her positioning by accountability pressures in this context.

***Summary of Objective A.*** In the episodes related to this objective, Brooke specified elements of her teaching context, but she did not identify or examine the implicit discourses of test-based accountability and how they define mathematics teaching in her practice or the practices of other teachers in her context. While she

identified the pressures teachers in the vignette may have felt in relation to their test-driven accountability context, in her own context, Brooke identified her local actions as independent of these discourses. Specifically, she seemed comfortable highlighting the test objectives framing her specific lessons, but resisted framing her understanding of herself as a mathematics teacher as related to the institutional discourses of accountability. In this manner, Brooke did not “critique the relationships between particular stories and broader interpretive frameworks” (Maher & Tetreault, 1994, as cited in Martin & Van Guten, 2002, p. 48). She also responded to other PSTs’ illustrations of problems of practice or tensions in their contexts with specific teach practices that did not address the tension, such as when she suggested to Maya to use center to address her concern about curriculum pacing and student learning. Across these episodes, Brooke did not clearly demonstrate this objective.

**Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.** This section focuses on how Brooke identified and framed the implications of accountability pressures on teachers, students, and schooling in Session 3. In these episodes, Brooke analyzed the practices and even the specific discourse of the teachers in the vignettes and she shared her own personal experiences. However, she did not clearly identify the implications of how she and others position students or problematize mathematics teaching in relation to or in response to principles of teaching.

*Describing teaching vocabulary terms and relations to teachers’ expectations (Session 3).* After reading the lesson transcripts of Teachers A and B (Appendix E), PSTs were generally supportive of Teacher B’s lesson. They appreciated his

conversational tone and the manner in which he did not emphasize the vocabulary terms the way Teacher A did. Brooke compared her teaching to how she understood Teacher B's teaching:

Brooke: It's like when you get kids to come up with their own, I keep going back this, because I thought it was the coolest thing, but when we taught kids about polygons we never gave them a definition. We put nonpolygons in one category and polygons in another, and they came up with the definition. There is only one correct definition, and everybody in math will agree, but, they came up with it therefore it's more, like, it's more important to them

Taylor: They have more authority

Jill: Okay, good point. Though, wait say that again? So you're saying that they came up with it in the end, but there was only kind of one way to say it that you gave them? Now what if you hadn't given them the definition in the end?

Brooke: Well we didn't. We went with their definition. We didn't tell them that.

Jill: What if their definition of polygon had been like all things that don't have corners?

Brooke: But that's like, that should be the teacher's role, though. It's to kind of almost play devil's advocate because kids can come up with a lot of this stuff on their own and when they do it's so much more meaningful and it's our job to point out, "Well did you think about

this aspect of it? What about this? This disproves your thought. Is there anyway you could get around that?” (group discussion, May 11, 2010)

Brooke described how she created opportunities for students to reason about how one set of shapes were different from the other and to define the differences, and she suggested that students were capable of this sort of inquiry. This comment aligns with *Principle 1, Responding to students*: When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx). Brooke felt that she gave students ownership over the vocabulary terms by allowing students to use their own words in their definitions. She presented a view of mathematics commonly held elementary PSTs when she suggested that mathematics was a defined, if not fixed, body of knowledge (e.g., Brown & McNamara, 2005), but she also felt that it was possible to create opportunities for students to reason about shapes and use their own words in the definitions, while also guiding them towards and giving students access to “one correct definition” through her questioning.

Brooke specified her practice and also aligned her strategies with a principle of providing students with access to opportunities to learn, specifically, *Principle 3, Responding to students*: Teachers need to provide all students with access to opportunities to learn. When I pushed Brooke to identify how she would respond to students if they did not have a correct definition, she examined her practices as a teacher and her responsibility for student learning. This suggests specifying of her practice.

While Principles 1 and 3 emerged in this comment, they did not emerge as salient to Brooke's understanding of her teaching. That is, there is not evidence of her problematize these principles or revisiting them in her later discussions or practice; rather, Brooke seemingly dismisses attention to teachers as providing access to opportunities to learn.

For example, as the conversation about Teacher B continued, Brooke did not emphasize this principle and suggested that teachers' expectations may not relate to their teaching. First, Brooke and others were surprised by Teacher B's interview, where he did not present high expectations of his students as mathematics learners or as in future careers<sup>26</sup>. Brooke stated, "She surprised me. I thought that it'd be opposite" because of how she understood Teacher B's teaching. Laura described Teacher A as having high expectations because of his interview, even though the lesson was "boring." Brooke and others nodded in agreement. Paige identified however that there is a particular view of how to teach mathematics that was present in her mathematics methods course and the ways in which Teacher A's presentation conflicted with this view. That is, Teacher A's teaching could align with high expectations, but "he values the vocabulary" more than she did (group discussion, May 11, 2010). Laura and Taylor suggested that earlier or later parts of his lesson could have included other instructional practices, such as opportunities for students to explore graphing.

Brooke responded differently, questioning the relationship between the interview and the transcript of Teacher A's teaching: "We all have lessons where it ends up just becoming we're telling them a fact and we just expect them to learn it. We're not always

---

<sup>26</sup> Teachers A and B are both male teachers, but during our conversation, PSTs switched between using the pronouns he and she to refer to the teachers.

these innovative, you know, inquiry-based teachers” (group discussion, May 11, 2010). Other PSTs identified how they were positioned and how this influenced their understanding of Teacher A and how his teaching may be consistent with having high expectations. Brooke did not take up these ideas and did not generalize to how teaching practices, particularly as they are repeated, could be related to how he positioned students, presented material, or provided students with access to opportunities to learn mathematics. In this way, Brooke did not align her practices with Principle 3, which emerged in her earlier comment.

Rather, Brooke made a distinction between how a teacher teaches and the expectations he or she has for his or her students. She asserted that teachers with high expectations could switch between a style of directed teaching and more inquiry-based practices, suggesting that the lesson and teaching might not relate to Teacher A’s beliefs. Although she valued a particular type of teaching, as suggested by her lesson and her appreciation of Teacher B’s teaching, she suggested that Teacher A could have high expectations, and in this lesson, he was just teaching in a different way. Therefore, she suggested that it is not possible to understand Teacher A or his teaching based on one lesson, and in this manner, she did not identify how particular strategies are consistently related to principles of teaching.

To encourage PSTs to see the particular mathematics that is missing from Teacher B’s lesson transcript and focus on issues of access to opportunities to learn that Teacher B provides, I ask PSTs to read Teacher B’s lesson to understand the term, domain:

Jill:                                      So if you read Teacher B, what's domain? Don't look at Teacher A.

- Candice/Laura: The words we're going to say!
- Brooke: He doesn't think they're going to need it.
- Laura: It doesn't say, unless he's drawing something on the board.
- Brooke: But that's okay. They're just trying to get the concepts first and then label them. (group discussion, May 11, 2010)

Candice and Laura identified that Teacher B did not provide students with access to a clear definition, but Brooke did not identify a problem with Teacher B's lesson. Brooke was not reflexive about positioning as relational, and she continued to imagine and describe Teacher B's lesson in a local context where he could have engaged in other instructional practices. Brooke attended to Teacher B's local moves but not how his actions are situated in a context of schooling and the influences on students more generally.

Brooke's comment followed Norah's discussion of the importance of access to advanced mathematics, Laura's insistence of the importance of foundational knowledge, and Michelle's suggestion of the importance of students' understanding of mathematical processes. Brooke did not take up these problems of access, student learning, or how teachers position students or specify them in this context. Rather, she sought to understand the discrepancy between Teacher B's lack of definition and how his practices are consistent with her lesson on polygons; that is, Brooke understood her lesson as providing access, and as she related her lesson to his lesson, she asserted that lessons that do not provide students with definitions may still be providing students with access to opportunities to learn mathematics. In this manner, Brooke may be considering issues of



access or Principle 3 specifically but she did not articulate a framework for understanding this principle or implementing practices consistent with it.

*Analyzing teachers' expectations in school contexts (Session 3).* To encourage PSTs to identify how Teacher B presented limited mathematics content in his lesson and how this may relate to how he positioned his students in the interview, I asked about Teacher B's interview and its relationship to the transcript:

Jill: So in Teacher B's reflection, where he says, you know, "They think they're never going to use math". So, if we take it to saying he has lower expectations, do you see that in what he says here?

Laura: A little bit when she goes, "You don't need to know that".

Brooke: I don't think she's saying that she feels that they're never going to achieve that. I think she thinks *they* think that. (group discussion, May 11, 2010)

Brooke interpreted Teacher B's comment as parroting his students, distinguishing between what Teacher B said and what the students said. She did not respond to Laura's suggestion that Teacher B limited access to particular mathematics. Similar to her comment about Teacher A, she did not connect teacher beliefs to practice and questioned my interpretation of Teacher B's low expectations.

When Brooke said, "She thinks *they* think that" (group discussion, May 11, 2010), Brooke identified the students' expectations as reflective of their own beliefs and not as related to how teachers position their students through the opportunities they provide to both learn mathematics and develop goals and self-efficacy in mathematics. That is, she dismissed the relational elements of positioning, and her comment is representative of a

normalizing move that turned the conversation away from including teachers' expectations as a problem of practice.

PSTs understood Teacher B's interview comment differently and this led to a lengthy discussion. For example, Candice suggested that Teacher B's comment about the students as "check-out girls" was derogatory, and Melanie felt that he had "negative images" of girls. Michelle wanted Teacher B's home address so she could talk with him about his negative attitude. Brooke did not laugh in response to Michelle's comment the way others did because she understood his response differently:

I don't think, I don't think that's true. I think that he's saying, "*They* have an idea. *I'm* never going to." I don't think that he necessarily thinks that they don't have that potential because he's saying, "*They* don't realize that math is going to be important to them, whatever avenue they do choose." I don't think that he's necessarily making a feminist comment or like saying they can't do it. I think he's saying this is what I see my students talking about and maybe that's things he's observed (group discussion, May 11, 2010)

Brooke did not see Teacher B's comment as representative of either low expectations of students or prevailing discourses of mathematics abilities of women in mathematics. Generally, she did not identify how Teacher B is either positioning his students or how he is positioned by discourses of mathematics ability and tracking that influence how he developed his expectations. She continued:

I mean, it's not like it's a terrible job. It's an honest day's work. I don't see what is necessarily. I mean, I went to an all girls' school and I guarantee you that there are going to be girls in there who work at Safeway [local grocery store] and run

the cash register but that doesn't mean that they're not living up to their potential.

It's just that's what they're choosing to do. That's my point. (group discussion,

May 11, 2010)

Brooke specifically defended the job of “check-out girl,” which likely relates to how her stepmother works in a grocery store. Brooke did not accept that Teacher B’s comment related students’ opportunities, teachers’ expectations, or tracking more generally, but rather she suggested students choose to be check-out girls. Educational research suggests that teachers’ expectations relate to their pedagogy, and teachers hold different expectations for students based on race and class (e.g., Delpit, 1996; Ladson-Billings, 1995).

Brooke’s comment is also consistent with research that suggests that teachers understand their students differently in response to accountability pressures present in test-driven school cultures (e.g., Diamond & Spillane, 2004). For example, research on educational policies in both England and the United States suggested that state-mandated reforms involving imposed standards and curricula and reductive testing lead to ability tracking and reduced opportunities to learn, in particular for children that the policies are designed to support (e.g. Apple, 2004; Diamond & Spillane, 2004; Valenzuela, 1999). That is, test-driven schools and accountability pressures create frameworks for understandings students and their abilities, in particular, that students’ abilities and career opportunities are fixed:

[Teachers and administrators] begin to harden their sense of which students are able and which students are not. Tracking returns in both overt and covert ways.

And once again, Black students and students in government-subsidized lunch

programs are the ones most likely to be placed in those tracks or given academic and career advice that nearly guarantees that they will not only have limited or no mobility but will also confirm their status as students who are less worthy.

(Apple, 2004, p. 37)

Test-driven school cultures create institutional discourses about teaching and students, including, but not limited to, equating student learning to student performance on the test, the importance of teaching to the test, notions of fixed student abilities, a focus on individual success, and one-sided positive notions about standardization (Apple, 2004). That is, these policies create discourses that then *interfere* with teachers' authentic teaching and learning relationships with children in their schools, as well as teachers' positioning of students (e.g., Olson & Craig, 2009). Analysis of Brooke suggests that she understood particular students as fitting within set expectations, as not needing the same access to opportunities to learn mathematics, and as not using particular mathematics (e.g., Horn, 2007). In this manner, Brooke's understandings of students are related to prevailing institutional discourses around accountability and the manner in which they present students, as well as prevailing discourses of mathematics as a discipline for particular individuals. For example, Brooke provided specific examples from her own experience to support her assertion that his comments were *not* related to tracking and were *not* evidence of social positioning.

In response to Brooke, Michelle said, "Check-out girls sounds bad. I'm sorry" and other PSTs echoed her response. The conversation continued for fifteen minutes and Brooke asked others why they were upset about Teacher B's comments. For example, she asked, "But do you think that his attitudes are negative?" "But do you guys think that

his attitudes are wrong?” and “Are we upset about the term girl?” (group discussion, May 11, 2010). Brooke did not take up how elements of Teacher B’s comment position students as unable to succeed in mathematics, express low expectations of students, and suggest that they only need consumer mathematics and she did not respond to these principles suggested by other PSTs.

The conversation offered Brooke many opportunities to take up Teacher B’s comments as a related to principles of teaching as providing students with access to opportunities to learn (Principle 3) and as treating all students as capable (Principle 1). Participating PSTs discussed *who* was saying “I’m never going to need math in the future because all I want to do is selling or be a check-out girl” (de Freitas & Zolkower, 2009, p. 197); that is, is Teacher B saying this or is he merely repeating what his students say? Melanie, Sarah, and other PSTs asserted that Teacher B was making a judgment about his students’ future careers and positioning them as check-out girls:

Melanie: By repeating it, in this manner, he's kind of saying, “I agree. Yeah.” He's not, I don't feel like pushing back.

Brooke: See, I don't see it that way at all. [Melanie shrugs] I think he's just repeating what he sees them feeling, and saying, “Okay, well if that's the direction you go, you still need math. So whether you want to become a scientist or whether you want to be a check-out girl, you're still going to need math.” I think that's kind of his point.

Michelle: What does it mean when it says, "Because all I want to do is selling"? What is, what is that?

- Sarah: Sales. I think working sales, which anyway, just sales would be a check-out girl. I don't see the difference. I don't see that there is any sort of, um, push for an actual career—
- Brooke: Really?
- Susan: Like a long-term sort of professional development. You know, when you think of someone's career, I don't know.
- Brooke: But these are the girls' attitudes, not his attitudes.
- Sarah: But he's saying it, it doesn't matter
- Laura: This is their idea. He's like just quoting them I guess-
- Sarah: Is it his, is it his place to-
- Laura: It's in the second part where I think that he's not pushing back, not in the first part. In the first part, he's just saying, like this is their idea
- Brooke: Yeah
- Laura: It's then, that he says, that's fair enough and he's, but even if this is what they are going to be, they're going to need math. He's not pushing, he's not going another step further and saying they need math and they can be more.
- Jill: What were you going to say Sarah, is it his what?
- Sarah: I can't remember.
- Jill: I think that it's interesting though,
- Brooke: Who's to say that it's more?
- Jill: Okay, well, it's, it's, what if, what if a student heard him say that?

Brooke: I think that's the type of thing that a teacher should say. If he sees his kids saying that kind of stuff, um, saying you know, I just want to be in selling or be a check-out girl. Then he has the right, he has the um job to say, okay but if you want to do that, that's fine, you can be anything you want but you still need math, so we still need learn this stuff. (group discussion, May 11, 2010)

Brooke did not agree with Melanie that Teacher B was reinforcing his students' career paths as check-out girls. She cited Teacher B's comment, "Math is important" (de Freitas & Zolkower, 2009, p. 197) to suggest that he was emphasizing the importance of mathematics. Teacher B emphasized, however, that students needed to know basic consumer mathematics, such as "making sure they're not cheating the customer" (p. 197). Brooke understood Teacher B as supporting his students' learning more generally, which may be related to how the mathematics taught in elementary schools is more closely related to consumer mathematics than secondary mathematics, which is the context of Teacher B's comments. Brooke did not respond to Sarah's discussion of access of opportunities to learn, her emphasis on careers, or the implications of his low expectations on his students. Rather, she focused on how teachers have a responsibility to teach all students mathematics and made a distinction between teaching students and influencing their career decisions. In this manner, she did not suggest practices that align with Principle 3.

*Examining the teacher's role in students' expectations (Session 3).* PSTs discussed Teacher B's comments in relation to goal setting, and Candice articulated that

teachers need to have a role in preparing students for careers and in helping students set high expectations:

Candice: You have to have a goal to reach and even if those are small goals. Um, it seems like kids, that are, or people of you know like, how sometimes, most of the time, people follow what their parents do, I think they need some kind of expectation, either to live up to, or you know, some people live down to expectations. So I think that starts even when you're young, like with dreams and goals and things like that. So you, I think that you have to go through life with some sort of focus, so we should probably start preparing them, even if that's not what they do. They can change when they're 25 or even in college but we, they should have some kind of goal, not just to like work at a store, even though I mean that would be great, but really, that's not great. That's not a great profession.

Brooke: No, that's a perfectly fine job.

Candice: No, it's really not, like you can make minimum wage. Do you know what it's like to live off—

Brooke: No, it really is. You can make good money, you can get benefits. Like working at a grocery store is a perfectly respectable job and if kids want to do that, I don't think that you have any right to judge it. Like, yeah we want to open possibilities to them, but who the



heck are we to judge them if that's what they do in their life?

(group discussion, May 11, 2010)

Candice emphasized the teacher's role in providing "direction" and "expectations" and more broadly in engaging in practices that prepare and allow students access to opportunities (Principle 3). Brooke did not respond to Candice's emphasis on teacher's expectations or the potential consequences of teacher's low expectations or students' lack of access to opportunities to learn. In response, she specified that the problem is that teachers should not judge students.

PSTs began to talk about career surveys, but Candice came back to the importance of inspiring students and the challenges of being a check-out girl:

Candice: It's just so funny like, okay, I guess we can, we can only inspire so much, and then if they're just hell bent on becoming a check-out girl, you're just like, alright like do that for two years and figure out how hard you have to work and what a terrible job that really is-

Brooke: It might not be!

Candice: Because I did do that and I was just like that is not something anyone aspires to be. That's what I have to—

Brooke: But people do, like people do, Candice.

Candice: I don't think. Ah, okay, that's not in my experience

Sarah: Immigrants coming to this country wanting a job—and will take any job that they can get, a lot of times. That's how those positions are filled. It's not middle class women filling those jobs. It's not.

- Brooke: So, let me give you an example here. My dad's wife is, has worked at Safeway for 25 years as a cashier. She loves it
- Candice: How did she start at Safeway, though?
- Brooke: She's college educated, she's college educated. She is an incredibly intelligent person, she's an incredibly social person, she does it because she makes good money, and she has benefits, and she does it because gets to talk to people all day and be social and work on those things that she really likes to do. She gets to, you know, do cash all day, and she gets to use math. She likes it so she's been doing it for 20 years and she gets great benefits and good pay.
- Jill: I wonder if that's she'd aspire-
- Norah: Brooke, I think, but Brooke, I feel like she might be an exception
- Candice: Right. How'd she get into that?
- Norah: to the rule of people who work at...grocery stores.
- Brooke: But I'm saying—
- Jill: Your point is that you can't
- Brooke: My point is that you can't, like, stifle people if that is what they end up wanting to do. Like, you have to open all these possibilities and if that's where they choose to go, then that's fine. (group discussion, May 11, 2010)

In response to Candice's discussion of her experiences and the challenges of working in a grocery store, Brooke described the work that her stepmother did and the positive elements of this job. She did not take up Candice's question of how her stepmother

started there, or more broadly Candice's emphasis on students' aspirations or the teacher's role in inspiring students. Brooke defined her argument as about not "stifl[ing] people if that is what they end up wanting to do." She agreed that teachers need to open possibilities for students, but as she dismissed the manner in which other PSTs operationalized this, such as setting high expectations and providing access to mathematics and careers. Brooke suggested that her role is not to push against the expectations that students set for themselves, but rather to support and value students' decisions.

*Summary of Objective B.* These episodes present how Brooke did not interrogate the implications of students' limited access to opportunities to learn mathematics or teachers' expectations on how students are positioned in relation to mathematics or how they understand their future career options. Although other PSTs attended to issues of access to opportunities to learn and how teacher's expectations matter for students' self-understanding, Brooke seemed to struggle or even resist taking up these issues in relation to teachers in the vignette or her teaching.

Brooke made a distinction between teacher beliefs and teacher actions, suggesting that teachers can have high expectations for students or not and in either case, this may not be apparent in their teaching. In this manner, Brooke was not reflexive about her positioning and how her positioning or how she positioned students related to her teaching. She also did not take up a principle of practice related to her discussion of her teaching or the teaching of either Teacher A or B. Brooke did not relate Teacher B's check-out girl comment to the social ramifications of Teacher B's or his students' expectations. Brooke's understandings of students are consistent with prevailing

institutional discourses around accountability and the manner in which they present students, as well as prevailing discourses of mathematics as a discipline for particular individuals.

In response to the conversation about Teacher B, however, Brooke sought to position herself in line with discourses in teacher education and ElCert in particular which emphasize supporting all learners and seeing diversity as a resource. She emphasized not stifling students ideas or judging their goals, but she did not articulate practices or respond to the implications of this perspective for her teaching or in relation to either her test-driven context or her own emphasis on teaching objectives. That is, she suggested that teachers need to respect all students and their career goals, but she did not problematize teaching as related to social responsibility. In mathematics teacher education, the emphasis on teaching equitably emphasizes not only the importance of supporting all learners and avoiding a deficit perspective, but also having high expectations and providing all students with access to opportunities to learn (NCTM, 2001).

In a backlash against a deficit perspective of students, Lubienski (2005) claimed there has been a paradigm shift towards “promoting strictly positive discussions of diversity,” which limits “critical inquiry into, and open dialogue on, the complex factors involved in equitably educating all students” (p. 35). Lubienski raised a particular example that relates closely to this analysis of Brooke across this objective. She identified that there is a prevailing notion that research must not make value judgments about the differences between students, including achievement differences. However, talking about “differential achievement” instead of “underachievement” or gaps “masks

the fact that school achievement is a major determinant of students' future life opportunities” (p. 34) and has serious implications:

The term [differential achievement] downplays the advantages that White, middle- and upper-class students have because of the strong correlation of race and social class with both school achievement and future economic success. If achievement truly is relative, then there is little need to promote opportunities for marginalized students to learn academic content and have access to greater opportunities. Moreover, there is no reason to examine the larger, structural inequities that differentiate educational and occupational opportunities by race and class. No matter how well intended, reframing inequitable school outcomes as value-free differences is an academic luxury not in the best interest of underserved students. (p. 34)

In a similar manner, Brooke reframed Teacher B’s comment about his students “being check-out girls” as about how he was avoiding judgments about his students. She emphasized how all students need to be supported but did not examine this issue critically or as related to the best interests of the students long-term. Analysis of Brooke across this objective raises questions similar to Lubienski, questioning how focusing on positive discussions of diversity limited dialogue about the complexity of teaching all students, and also emphasizes the need to challenge teachers and PSTs underlying assumptions about equity, particularly as related to practice and current teaching context (e.g. Crockett & Buckley, 2009).

**Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling**

**more broadly in relation to self as mathematics teacher.** In this section, I focus on how Brooke did not critique prevailing institutional and social discourses in relation to herself as a mathematics teacher or reposition herself. In writing assignments after Sessions 4 and 6, her participation in Session 6, and her interview, Brooke specified and identified how she was positioned in relation to her local context, but she did not articulate prevailing discourses present in her context or articulate how she and other teachers can reposition themselves in relation to prevailing discourses of race and class that influence teachers, students, and teaching.

*Examining her positioning in her classroom (Written responses after Sessions 2 and 5).* After Session 2 and our conversations about how they are positioned in relation to the prevailing social and institutional discourses they named, PSTs responded to the following prompt: “How do you feel positioned as a math teacher or in your math classroom? And how do you position yourself as a math teacher or in your math classroom?”

In Brooke’s response after Session 2, she explained that the internship program and her position as a PSTs influenced her classroom teaching opportunities and how she was positioned in relation to her mentor. She identified that her mentor positioned her as a teacher’s assistant, and this influenced her ability to teach mathematics because her students saw her as an assistant and then “were less motivated and unsure about what I would tell them” (Positioning statement, May 8, 2010). Other PSTs also characterized their positioning as *localized*, or in relation only to their mentor and particular placement, to the exclusion of how they positioned themselves towards or were positioned by broader social, institutional, or political discourses. Analysis suggests that Brooke, and

others, were strongly attending to their local contexts to make sense of how they are being positioned as mathematics teachers.

Brooke revisited this written reflection at the end of Session 5, and she elaborated on how she saw herself in relation to her students:

I realized the positioning should not just be about me (few [*sic*]!!) I saw positioning as how I directly affected, not how I affected others. I also saw myself as being positioned, but after our recent discussions, I realized that I have indeed positioned myself in certain ways. The most important of which is how I position myself with the students. This is actually the basis of my portfolio theme. I picked a coach because I want my kids to see me as someone whom asks relevant questions and takes the time to work through challenging issues along side them, as a team. Math was not my favorite subject when I started teaching; it was very intimidating. However, I believe that it has given me the best opportunity to position myself as a coach (the type of teacher I aspire to be next year). (Revisited positioning statement, May 31, 2010).

In this reflection, Brooke identified how she positioned herself in relation to her students and how she has agency in the way that she positions herself. She generalized her positioning to being a “coach” and described specific actions that relate to this theme, such as working through tasks with students. Brooke’s focus remained on her local context in this reflection, and she did not identify her positioning as related to prevailing social and political discourses in her classroom<sup>27</sup>.

---

<sup>27</sup> Although other PSTs in the initial reflection after Session 2 also discussed positioning as localized, in the reflection after Session 5, most PSTs identified issues of their test-driven school culture, curriculum pacing, racism, language, and student abilities as related to how they are positioned and how they position others.

After Session 5, PSTs also submitted a written reflection on our seminar in response to my request for feedback on our seminar and guiding prompts: “Have these meetings helped you think about mathematics teaching or yourself as a mathematics teacher? If so, how? What have you learned so far about yourself as a mathematics teacher? What do you have questions about?”

Similar to her other written reflection after Session 5, Brooke identified the relational, localized elements of her positioning:

I think I have genuinely learned more about myself as a teacher through this reflection group than anywhere else. Thinking about positions, especially the rewrite due this week has helped me realize there are dimensions to the situation that a classroom is in. Each participant: from the student to the teacher to the parent and so on affects the structure of the class. I do feel that I was doing the right things as a math teacher, but only because I was copying what my mentor did verbatim. ... Understanding that so many people affect everyone else's position is a bit overwhelming if you think about it. (Reflection on our meetings, May 31, 2010).

Brooke presented her positioning in relation to person-to-person relations and specified how each “participant” is important and how “so many people affect everyone else's position.” Brooke described positioning as an active process, in relation to others, which suggests how Brooke developed understanding of the relational elements of her positioning.

***Describing her response to and understanding of race in her classroom***

***(Session 6).*** In Session 6, we watched an episode of the HBO television drama series *The*



*Wire* (Zorzi & Hemingway, 2006). This activity served to give PSTs an opportunity to identify and problematize the intersection of discourses around accountability, race and racism, and urban schooling (full rationale is presented in Chapter 3; transcript of episode in Appendix H). After our viewing, I asked PSTs about what they felt that the *episode* was saying about students. I wanted PSTs to interrogate the manner in which the episode, as a piece of media, was promoting and encouraging perspectives of teachers and students, such as a perspective that African-American students in urban areas do not care about schools or that teachers can make a difference. PSTs' initial conversations focused, however, on the students' and teacher's actions, and they responded as if the students in the television drama were real students (See case of Candice, Chapter 4 pp. 133-138 for detailed information about the PSTs' engagements with this activity.). In the discussion, PSTs moved to emphasize the importance of being a critical viewer when watching similar television dramas.

Brooke made few comments during the in-class discussion, but she submitted a written reflection discussed this session in our interview. In her reflection, Brooke said that she did not see our conversation as grounded in evidence from the school, the episode presented, or her experiences with students or teachers in urban schools:

I truly felt that in our discussions we were looking for issues. You can read into almost anything if you want to. I felt that a white teacher teaching black students was just that. I do agree that I look at this situation from a critical perspective, and that not all people have the background. Shows like this are entertaining, but you cannot sensor things because some people just accept what they see as truth.

(Written reflection on *The Wire*, June 6, 2010)

Brooke also asserted that racial background was not an influence on the teacher-student relationship. She suggested that she had the background knowledge to be a critical viewer and not make assumptions about teachers or students as a result of viewing, and she did not identify or problematize the multiple dynamics at play in the classroom, the school, or the presentation.

Brooke related Mr. Pryzbylewski's practice, as portrayed in *The Wire* (Zorzi & Hemingway, 2006), to her own classroom practices:

I think that it was good that the teacher developed his lessons around student interest. I don't think that stereotyped them, but interested them. He picked gambling, not because of a stereotype, but what was directly in front of him. In my instruction, I always try to focus lessons around things that my students have shown interest in. Some might fit certain stereotypes, however, that has nothing to do with why I select certain interest topics. (Written reflection on *The Wire*, June 6, 2010)

Brooke did not respond to the distinction that I attempted to make between the students and teachers in *The Wire* and the show as media. Instead, Brooke suggested that the teacher's use of gambling was aligning with student interests, which she stated as an objective of her instruction. The ElCert standards also suggest using instruction that is appropriate to students' cultural backgrounds and "integrate culturally diverse perspectives and resources, including those from the learners, their families and communities, into the curriculum" (Appendix A). Mathematics education also emphasizes the importance to understanding students and their cultural and linguistic backgrounds, but within this focus, there is also attention to issues of access to equal

opportunities to learn conceptually rich mathematics and the importance of high standards (e.g., NCTM, 2001).

Brooke closed her written reflection by emphasizing that she did not see the task from this session as helpful for her own understanding of herself as a mathematics teacher or her teaching: “Jill- I don’t have a ton of deep thoughts from the Wire. Sorry” (Written reflection on *The Wire*, June 6, 2010). Her response suggests that either she did not see elements of the presentation as problematic or that she felt comfortable with her responses to these dynamics. In this manner, neither *The Wire* as an example of real students or as a piece of media created opportunities for Brooke to examine how current test-driven accountability pressures or prevailing issues of racism or classroom surface in classrooms.

In her follow-up interview, Brooke discussed her reactions to *The Wire* and our discussion in manner consistent with her written reflection:

I definitely felt like we were just looking for issues....It just happened to be a White teacher teaching Black kids. Where as Candice saw it as, “No, they’re trying to show a supremacy thing and it’s very different. And they’re trying to show that they own something over the Black kids.” And I was like, “I don’t think it’s that deep.” I don’t think it was. (interview, July 16, 2010)

Brooke clarified her written response and emphasized how she did not see racial background as important in teaching situations. Brooke felt that Candice’s interpretation of the prevailing discourses of race and racism was inaccurate and overstated. She continued:

And I just kind of felt like, I'm a White teacher. I teach Black kids. I don't, I'm not trying to show my ownership over the Black kids. I'm trying to get them to do what they're supposed to and I try to get White kids to do what they're supposed to, too. And they don't listen just as much. So, to me it was, I kind of felt like it was a fishing expedition rather than a conversation. (interview, July 16, 2010)

Brooke identified herself in this context. She described engaging in the same practices and expectations with all students, which is consistent with her understanding of *The Wire* as an incident where it “just happened to be a White teacher teaching Black kids.” Brooke responded that all students are the same, and resisted identifying any other dynamics of the classroom environment or accountability context. In this analysis, Brooke's comments here present how she did not demonstrate this objective of examining or critiquing the implicit discourses in this teaching situation in relation to self.

I asked, “So, wait, you don't think that it matters, a White teacher teaching Black kids?” (interview, July 16, 2010). I presented this complicated issue simplistically, which may have limited Brooke in problematizing this issue. She responded:

Absolutely not. Absolutely not. My kids. You know, it was the coolest thing. I taught my kids about Martin Luther King this year, and I started it by, “Can you imagine if Elijah and Rachel couldn't be in class together?” And then I named a couple other kids that couldn't be together, and they were like, and they were like [wrinkled forehead, presenting a puzzled look]. They didn't get it. They were like, “Why wouldn't they let us be together? We're friends.” Like, they didn't

even, it didn't even make sense to them, which was so cool because like racial tension *was not in their* classroom and it wasn't in their families so why would anybody try to introduce it to them. Do you know what I mean? [no response] Why wouldn't we teach them about what happened in the past and say, "We've gotten a lot smarter. We do it right now. We have Rachel and Gerald in the same classroom. How much better is that?" And the kids were like, "Yeah, its' a good thing we got smarter, and we do it right now. It's a good thing that people stood up." And they understood it. But I wasn't, I taught them about the past, but I didn't make it an emotional tangle for them. I didn't try to draw them in emotionally because they weren't involved in it. And they don't have to be involved in it. They can be just as good as a purple person or a white person or whatever you want to call it. Um, that was something that I felt very strongly about. (interview, July 16, 2010)

Brooke responded to my question, shaking her head adamantly. She described her own teaching and her students' response to her introduction to the work of Martin Luther King, Jr. and asserted that her students had not experienced any unequal opportunities because of race. Brooke's use of the phrase racial tension relates to what is commonly referred to as racism or an act that "even unwittingly, tolerates, accepts, or reinforces racially unequal opportunities for children to learn and thrive" (Pollock, 2008, p. xvii). She asserted that all "students can be just as good as a purple person or a white person or whatever you want to call it," which suggests that she did not understand issues of racism as being prevalent in schools or in current discourses of test-driven accountability.

Brooke did not want to engage her students in an “emotional tangle.”<sup>28</sup> Specifically, as she actively rejected how race and racism influence her as a teacher and her teaching, it is not clear that Brooke understood this as part of her role as a teacher or a mathematics teacher.

*Summary of Objective C.* The episodes across this objective present the manner in which Brooke struggled to take up the implications of institutional discourses of test-based accountability or social discourses of racism and classism in her understanding of herself as a teacher. She did not relate to the ways in which social positioning of students by race or class related to systems of test-based accountability or relate these issues to her own self-understanding. This is significant because the focus across our seminar sessions included these issues as related to students’ access to opportunities to learn and teachers’ instructional practices. In these episodes, Brooke, however, described herself in her local contexts and how she responded to her students in her school, and her discussion of her positioning evidences a more specified position, if not *repositioning*, in relation to issues of race in her classroom.

**Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.** This section presents episodes from Session 4, Brooke’s written reflections on her artifact of practice, and her final reflection on her mathematics autobiography. In these episodes, Brooke and other PSTs discussed her practices of grading students’ work. In the following presentation, it was important to present large sections of dialogue in order to show how Brooke did not respond to the opportunities to problematize practice or to the questions that other PSTs

---

<sup>28</sup> Brooke’s students were second graders, and I agree that discussing racism with elementary students while attending complexity of this issue would be challenging.

were grappling with around teaching and evaluating students. Across these episodes, Brooke did not problematize teaching or principles of practice. In her reflection on mathematics teaching and learning, she emphasized how ability grouping was an important element of her mathematics instructional practice, but analysis of her reflections across these episodes does not suggest that she repositioned herself as a mathematics teacher in relation to prevailing discourses in her school context or understood ability grouping and its implications differently.

***Describing practices of grading student work and engaging in practices that move the conversation away from problems of practice (Session 4).*** In Session 4, we discussed PSTs' artifacts from teaching as a means to situate PSTs' conversations about themselves as teachers in their own practice and to support PSTs in connection their practice to implications for students' learning (see Appendix B for more on the lesson plan for Session 4).

Our discussion of classroom artifacts led a discussion about assessing and evaluating students' progress. Candice was concerned about grading students work and specifically, how to balance supporting students in reaching mandated curriculum goals, providing access to opportunities to learn, and supporting student's individual growth and differences:

Candice:       And as teacher, sometimes that's hard because you don't know if it's like their best, or, like I've found it difficult to judge their work and like assess it. I'm not sure. Like, I know you're still learning to write, but you're supposed to be writing sentences, and it's just like the curriculum and where they're supposed to be and where they

are is. Like, I don't want to break their pride or your spirit or anything, but also I want to get you where you need to go. So, just that balance, and I know a lot times home life and all that connects with that so, it's just like.

Jill: So, want to show them that you care, but at the same time, you don't want

Candice: I don't want a kid to always get a 1. Like, you know, it's this big thing if you're not a one kid. You want to be a "ten boy" or a "ten girl." But if they're not doing ten work, but they're trying their— Like, it's a ten for them, but it's not a ten according to our rubric. And I actually had a conference about that because I was giving out too many ten's. And like, "Do you really think this is ten work? Like on a BCR, you have to do this, this and this," and I was like, "Okay, that was his ten," and I, he put forth effort, he sat next to me and he tried, so I don't give him a ten on his best try? So, why would he try again?

Brooke: But see what we do is we give, we have star, smiley face and checks. And because we're primary, and we don't give out A's, Bs, Cs-

Candice: Same here, it's exactly the same here.

Brooke: We do have that flexibility. So I use that a lot. So, I, well, kind of for the kids I know are not meeting the expectations of the class, but are really trying their best, they'll get a mixture of smiley faces



and stars, star being the highest, because I want to affirm that, but I also want them to know that they need to keep going and what they're doing isn't perfect yet, they should just keep working as hard as they can, just like an on-grade or above-grade level student should be pushed the exact same way. Like, they should be encouraged but they should also know that you know there is always room for growth, and you keep moving forward and you keep learning new things. (group discussion, May 18, 2010)

Candice identified how measuring students in relation to mandated curriculum goals can conflict with evaluating students' individual progress and individual differences. In response, Brooke defined Candice's problem as about effort and students' self-concept and not about students as individuals or their understandings. Brooke engaged in normalizing moves that turned talk away from teaching by providing categorical advice, specifically suggesting that her two grading systems, a one-to-ten scale for evaluating student responses and separate marks for effort, which others call the work habit grade, solved Candice's problem. She did not identify the problem as a generalized problem of evaluating student progress, rather she positioned Candice both as less able to respond to this problem because she does not have these two grading systems and also as "a passive recipient of others' advice" (Horn & Little, 2010, p. 192). When Candice said that she did have these two grading systems, Brooke continued to suggest that these two grading systems solve her problem.

In Brooke's response, she dismissed Candice's problem, but her response did not address Candice's underlying concern of how to balance individual student outcomes and

outcomes set by curriculum objectives. Brooke suggested that with both grades she could encourage students and also let them “know that there is always room for growth” (group discussion, May 18, 2010), but this is not the same as Candice’s concern with meeting standardized curriculum benchmarks and helping different students achieve at the same level. Brooke did not relate her practice to curriculum pacing or operationalize *how* to balance encouraging students and set benchmarks. She relied on labeling students abilities, for example, designating her students as “on-grade level,” which did not highlight students’ individual growth.

Brooke’s response was different than the other participating PSTs, who took up assessing and evaluating student work as a problem of practice and discussed generalized principles about teaching. In spite of Brooke’s discursive moves that served to turn the conversation away from a problem of practice, other PSTs engaged in specifying, revising, and generalizing the problem and identify principles, strategies, and actionable steps in relation to issues of grading and assessment. In this way, this conversation seemed to offer many PSTs opportunities to discuss and problematize teaching in a principled manner.

*Explaining practices of reporting student progress (Session 4).* Sarah explained her classroom practice of continuously giving students feedback while they were working on a long-term project and how this led to less variance in grades across her students<sup>29</sup>. Laura identified a tension in this practice, concerned that students may have the same grade on an assignment, even though they have had varying levels of assistance or are capable of different work independently. In this manner, she was concerned that the grades may not capture differences in students’ abilities when some students are given

---

<sup>29</sup> Sarah’s complete response and analysis is in the case of Sarah in Chapter 6.

assistance<sup>30</sup>. In response, Candice stated that in her school, she cannot give a student who has been given assistance a high grade at all, thereby complicating Laura's problem and describing how the grading system may not capture student understanding. Brooke stated that she marked students' report cards with the designation, "With Assistance" (Eastern County Report Card; Appendix M), in order to note teacher assistance:

Brooke: It's "With Assistance."

Candice: Right, that's like

Laura: I've seen that on report cards.

Candice: And, it's like really, this is school, so shouldn't they all have assistance, if they need it?

Brooke: Not unless they deserve it. (group discussion, May 18, 2010)

Brooke did not respond to the tension Laura identified about how to explain the complexity of students' understanding of the material with a grade, but suggested that flagging a students' grade identified that the student received assistance. Candice offered Brooke an opportunity to problematize assistance and how schools should provide assistance, but Brooke did not describe how she determined if students deserved the grade, which was the problem that Laura and Candice identified.

Laura clarified how her concern with grading is also about supporting students in becoming proficient and working independently:

Laura: But I think like it would be good to have that feedback of whether—See, I think they deserve the grade, but I wish that we could give that second grade out of independently or with assistance because I think that it's important to know like, does the

---

<sup>30</sup> Further analysis of Laura's comment is included in Chapter 8 in the case of Laura.

kid need extra scaffolding to get to that point or are they working independently? Because the goal is, as they get older, they need to be able to do things independently. That's where we're trying to get them all. Because what's going to happen as they get older, if they're not working independently, they're not going to have that person sitting next to them, assisting them. I think it's important that kids know, and for the parents also to know, know maybe we're helping him, making sure your kid is getting. Actually, we had that, with, we've had this in a few conferences with parents. They're like, "My kid's doing fine. They're getting Cs." Well, they're getting C's with assistance. And then the parents don't understand, like why are you giving my kid assistance? We're like, we're not going to let your kid fail. Um, so I that is an important message to know, you know, whether, how they're getting those grades. Like, just more for the growth of the kid.

Jill: We do this in our society a lot. Like, we measure people all over the place, right. I mean, that's what we're doing. We're like putting them on, we have to, we want everyone to get everyone to get X score on these things and we have to reach this certain level. And it's like, when do we want to support that idea and when do we not want to worry about that? Like, you don't want the kid to finish third grade and have to do everything "with assistance," but at the same time, it can't always matter, you know?

Brooke: You have to find that line between honest and supportive. Because if you're, like if a child's not doing it on their own, you can't give them like the highest grade every time because then when they get to the next teacher, the next teacher starts giving them W's [With Assistance] instead of I's [Independent], the parents are going to be like, "What is this teacher doing?" Well, no, the other teacher inflated their grade, and like, wasn't giving a true estimate. So I think that you have to be honest with parents and say, you know, "Okay we're helping him here. Let's figure out a plan that we can get them to I's on their own so they have that achievement. It's not the teacher helping them have that achievement, they have that achievement to celebrate. (group discussion, May 18, 2010)

Laura specified how the "With Assistance" mark did not clearly explain *how* students are working towards that objective, and she also identified implications for parents' understandings of students' grades. In response to Laura, I highlighted an underlying issue of standardizing grades and the role of and value placed on assessment systems. Brooke's advice about a "line between honest and supportive" did not operationalize Laura's concern for consistency in her practice or attend to my question about the importance of standardized systems of grading. She described her practice and the implications for parents' understandings of their students, but suggested that there *is* a true estimate or the possibility of an objective grade. In this way, Brooke was not reflexive about positioning as relational when assessing students, and the work of repositioning in relation to issues of test-based accountability is not evident. For

example, Brooke did not respond to the questions that other PSTs were grappling with around teaching and evaluating students. She offered an unspecified strategy of “finding that line between honest and supportive” which was what other PSTs were attempting to operationalize.

***Describing evaluating and reporting practices for students labeled as special education (Session 4).*** Melanie called grading subjective, questioning Brooke’s search for a “true estimate:”

Melanie: It's just subjective. And you know, no matter what we do it's subjective. Everything, if we all had the papers, the same kind of list and graded, we'd probably come up with like ten different grades because what I think is a success, could, you know, and that's going to happen year to year, and I agree we don't want to balloon them up to this point, when we know, but

Candice: And at what age? Like, is that important, is that important in like first grade when they're learning letters and sounds? I mean, they can't put together a complete sentence is different than not knowing all of your letters, I understand that, but at what point do we give the judgment? They're out of control.

Brooke: And then you think of all the bad grades a kid can get. Because on our report cards, if we have a student who “Needs Improvement” on like eight of twelve areas, not even like “With Assistance,” but like “Needs Improvement,” she'll only give two “Needs Improvement,” even though it's in no way accurate of where the

student is because it's not tangible to a parent. A parent can't say, I need to work on all of these various things and I have idea where to start. So it's like, so, even though I don't agree with inflating, we do it automatically because there is no way that one parent can—  
(group discussion, May 18, 2010)

Melanie suggested that identifying how to grade students in a consistent manner, particularly across grade levels, is unrealistic. Candice pushed Brooke for more specificity of her claim of a “true estimate,” and she also raised a problem of practice when she discussed how evaluating students, particularly in first grade, happens in an “out of control” test-driven school context.

In response, Brooke described how her mentor’s practices regulate her grading practices. She specified her mentor’s practices of grading and assessing students and her mentor’s understanding that parents will feel overwhelmed by too much information about their children. Brooke did not situate her grading practices in relation to a principle of assessment or evaluation or take up Melanie’s or Candice’s concerns. Her comment did not address her own concern about a “true estimate,” and rather she presented another example of the subjectivity of grading practices.

When Brooke described her mentor’s practice and her expressed perspective of parents as not capable of understanding their students’ needs in school, she did not identify her own agency in questioning her mentors’ practice or question why a student can only receive two “bad grades.” It remains difficult to discern what assessment means to Brooke or what she understands about evaluating her students. She identified strategies, such as searching for a “true estimate,” and actionable steps, such as only

listing two areas on which a student needs improvement, but these ideas were not connected and could be understood to be in conflict.

Norah, Melanie, and Candice questioned Brooke's practice of only marking two areas of Needs Improvement and responded at length. Norah suggested that this practice would not inform parents of their students' understandings and may lead to a parent being complacent, thinking that his or her student is performing well in school. Melanie suggested that report cards are not the place for parents to find out about their student's progress, and instead parents need to be informed regularly and engaged in the process of supporting their student. Norah and Melanie problematized Brooke's practice as it related to implications for parent understanding and parent agency in supporting their students.

Candice continued to discuss Brooke's practice and connected assessment back to instruction by sharing an example from her own practice:

But, is that not a reflection of you as a teacher? If a child needs eight out of twelve? Like, maybe something's going on with the way that it's delivered or something else. Like, I know that I taught one lesson and I was just like, *Whoa*, like this is. Obviously something was wrong with the way that I taught the lesson. And they [other teachers in her school context] were like, "No, the kids just probably weren't listening" or like dadada, and I'm like, "No it's okay, I like can take it, like, I will take that. I know that, if one or two people maybe, but like seven or eight out of fifteen, then there's a problem. (group discussion, May 18, 2010)



Candice's comment is significant because of the connection between instruction and the manner in which she included her own teaching in this discussion. Through presenting how she had unsuccessful lessons and related student learning and teaching, Candice opened an opportunity for Brooke to discuss her own practice.

In response, Brooke contested how Candice's example related to her context where she had students designated as receiving special education students. In the following dialogue, Brooke provided details of her context and her students and suggested that her grading was in response first to the requirement to use the county-mandated report card and then to her "mood":

Brooke: You have to think about like your inclusion students though. My special-like kids, there are some of them who will never be on grade-level and like, their writing will never, like they don't have the motor skills

Melanie: But they have, but you're aware of that. They have IEPs, They have things

Brooke: Exactly

Candice: They have goals, also.

Melanie: But if I have a

Candice: Like, are they reaching their goals?

Brooke: Right, but that doesn't change their report card. They don't have a different report card because they have an IEP. Like their report card has the exact same standards as every other second grader in the school. So like, they might need improvement on their writing,

they might need improvement on this, this, this, this and this, and you know, you push them, but they're always going to be in a different place.

Candice: That doesn't make sense.

Melanie: Yeah, but with those parents, there is the dialog that I was talking about before. The parents know where they're at. You can be, you're constantly communicating with them, improvements that you're seeing them, and those goals are probably more on what they're focusing on than that report card because they are aware of that, too.

Taylor: And that goes in to the subjectiveness of grades. Are you grading them on what their abilities are or are you grading them on what everybody else can do?

Brooke: And I'll be honest sometimes that it really kind of depends on my mood. Like, sometimes I'll be like, you know, it's just that kind of day that I'm willing to be harsh on everybody which is bad because I know that we should be really consistent, but some days

Norah: But we're human. Like, we're not machines. We can't sit there and cut out the subjectivity and the emotions of the classroom and, you know. It's hard-

Candice: Do people with IEPs, like in an inclusion class, are, they're not held to the same standard-

Brooke: Yes!

Candice: So why would they be judged the same?

Michelle: No, we grade them on, they're either, we grade them—they're below-grade-level. So, we'll grade them on below-grade-level standards.”

Brooke: But, there's still, like a kid who is non-verbal, is not going to have good oral communication skills. And like, but it's still going to be on their report card. We still gotta fill it out. It's still like a check [checkmark].

Jill: It's not “Not Applicable”? You can't just leave that one blank?

Brooke: Yeah, but we don't. [laughs] (group discussion, May 18, 2010)

She dismissed Candice's connection of assessment to teaching and described how her inclusion students need improvement in many areas, independent of her teaching.

Brooke discussed assessment as a practice that was not only distinct from but also *independent* of her instruction. Brooke also suggested that she had to report students' grades on the report card in a particular way and did not have the option of thinking about grading students designated as inclusion as differently than other students.

In this manner, Brooke described the problem of grading students as not a generalized problem of practice, but as problem of the *students*. She specified her problem as related to her local situation in her inclusion classroom. It is significant that the fields of mathematics education and special education have contrasting pedagogies (e.g., Boyd & Bargerhuff, 2010). While mathematics education focuses on student-centered learning and understanding through exploration, teaching in special education is more likely to target procedural knowledge and specific measurable objectives and these

practices are supported by research in special education (Boyd & Bargerhuff, 2010).

Brooke's continued emphasis on her inclusion students suggests that she conceived of student learning differently, and this may be related to students' special education status.

Across the conversations in Session 4, Brooke seemingly resisted generalizing to or responding to problems of practice. She consistently offered her specific classroom practices, but did not respond to the questions that others were grappling with or situate problems within a network of problems. For example, Candice offered Brooke an additional opportunity to identify how she could modify her assessment procedures when she asked if her inclusion students have different goals and how they related to the report card. In this manner, Candice identified differences across districts and across classrooms, and also sought to challenge the idea of standardized grading systems. Brooke asserted that all students, including her inclusion students, must be assessed in the same manner, and graded on the same standards.

Brooke aligned her understandings of teaching with standardized grading practices. Brooke aligned her practices with discourses about tracking and fixed abilities: "They're always going to be in a different place" (group discussion, May 18, 2010). Brooke's practice of not accommodating for students by grading them differently, such as grading the student who is non-verbal on his oral communication skills, reinforces the tracking of students across grade levels. Other PSTs questioned her practices and sought to raise questions about principles around assessment, but in contrast to the attention that Candice, Melanie, Norah, and Taylor gave to Brooke and her mentor's assessment practices, Brooke said that she did not give attention to her own assessment: "It depends on my mood." Brooke's comment highlights how she was not engaged in problematizing

her practice or in creating a stable resource for understanding assessment, its role in her classroom, and its implications for students.

***Detailing instructional practices and ability grouping (Written reflection on artifact of practice).*** I asked PST to use a particular artifact of their mathematics teaching and detail the episode of teaching, their expectations, what happened, and student responses. I encouraged PSTs to make connections between this episode of our teaching and our current discussions about prevailing discourses framing their instruction (Appendix B). Brooke responded to this writing prompt detailing the volume lesson that she explained in Session 1 of our seminar and that I analyzed under Objective A (See pp. 210-218).

In response to this prompt, Brooke described how students had difficulties with this lesson that she was not expecting:

I was planning on showing kids a picture of a 3-D object and modeling how that object is built using centimeter cubes. I wanted to build layers, so that they can see how the object is constructed. The method of I do, we do, you do was perfect for this lesson. I expected that students would build the models, have an “ah hah” moment and be ready to move their new found knowledge to paper. I thought this might take 1-2 days. Well, that did not happen. This objective took a full week, and not all kids got it. My mentor tells me that’s because the kids were not developmentally ready for that abstract of a concept yet. (Written reflection on artifact of practice, May 31, 2010)

Brooke described her students as unsuccessful and “not developmentally ready.”

Consistent with her discussion of her students during Session 4, Brooke identified the

problem of students' understanding of volume as a problem of the *students* and not a problem of teaching practice. For example, she described her students as capable of success when she modeled:

The kids did a great job of building the objects with me. When it was time to count, kids seemed to think the object was hollow. They would forget to add the center cubes. We must have modeled building and counting different objects 20 times, but some kids just did not make the connection. ....With some students I took the manipulatives away and had them color layers on a picture to see if that was easier for them to understand. For some, it worked... others, not so much.

(Written reflection on artifact of practice, May 31, 2010)

Brooke defined her students' lack of success as a problem with her students and not part of a larger class of problems that includes how to provide students opportunities to analyze mathematics and make connections. She also hypothesized about why they may be having trouble, for example, they thought that the object was hollow; however, she emphasized what students were *not* doing and not what they were doing. In her written response, Brooke did not specify or revise her practice when explicitly asked to discuss what she would do differently or the implications.

Brooke identified how her students are in ability groups and suggested how this may have interacted with their learning.

One discourse that shaped my planning was that I have a strong group of above grade level children. They get everything instantly and are basically brilliant.

That being said, I positioned myself to underestimate their different needs. I did not know them well enough as learners to know what would really confuse them

and what they were able to tackle in their little seven-year-old brains. (Written reflection on artifact of practice, May 31, 2010)

She suggested that she underestimated the needs of her “basically brilliant” students, but it is not clear that she recognized how ability grouping itself created these perceptions of her students’ abilities and needs that influence both her teaching and their learning. She emphasized her students “little seven-year-old brains,” defining the problem as with her students and not of teaching. Brooke identified that student frustration may relate to her students’ performance, which she did not discuss in Session 1; this is evidence of Brooke specifying and revising her reactions to her teaching.

Brooke closed her reflection, noting that this objective “was definitely a rough spot on our post assessment.” In this written reflection, and in her final portfolio presentation where she discussed the same objective, Brooke focused on the assessment and ability grouping but did not problematize the complexities of this teaching episode or how the pressure of the assessment or the practices of ability grouping influenced her teaching practices specifically.

***Describing and supporting students’ positioning in the mathematics classroom (Revisiting written reflections on mathematics teaching and learning).*** After Session 7, Brooke revisited her reflection on mathematics teaching and learning, an assignment that PSTs first wrote for their mathematics methods course in September 2009 (Appendix I) and revisited at the end of the Fall semester (Appendix J). In this assignment, I asked PSTs to revisit their written assignment “and add to, revise, and make comments on *both* the autobiography part and the second part about good math teaching. Use track changes when you add new text and also highlight specific parts and make comments.” This

assignment was designed to ground our discussions in their own mathematics teaching and learning experiences (full rationale is in Chapter 3).

In her written reflection in September, Brooke identified how ability grouping both in class and as a system of tracking across classes existed in her high school. In December, she outlined the ability grouping in her second grade classroom and how this system of within-class grouping by ability has implications for student learning:

Even in second grade, kids are grouped with other students at their level.

Although it seems unfair, I really don't think there would be another way that would properly support students. The part that bothers me most about tracking is that students are not afforded an opportunity to move to a higher group, because they are learning what the kids in their current group are learning. Each class might be learning a different topic. If there was some sort of enrichment pull-out to help kids advance that want to, but need support, that would be a great solution.

(Reflection on mathematics teaching and learning, December 1, 2009)

Brooke accepted grouping students by ability as a necessary practice to support students on their level but identified how within-class ability grouping influences students' access to opportunities to learn. In June, she highlighted this comment and dismissed this concern as a problem of practice: "I think the more important thing here is teachers helping students understand that being at a different level than others is not something that is bad, it is what you need. All people regardless of group can get to the same place. They just need different things at the present" (Revisiting reflection on mathematics teaching and learning, June 13, 2010). Brooke reframed ability grouping as an appropriate practice that has the potential to respond to student differences and support



all students in achieving the same level of achievement, whereas earlier she questioned this. Brooke normalized this problem of practice as a problem of students not understanding the system.

In December, Brooke added to her discussion about teaching and expressed surprise about how students who were struggling in class did not take up opportunities for extra help: “My struggling students are recommended for free tutoring though the school. Surprisingly, the two students we recommended for tutoring declined. They continue to struggle in our math class and as a result are being moved to a lower level” (Reflection on mathematics teaching and learning, December 1, 2009). Brooke described this a problem of student understanding and did not problematize why students decline tutoring or the institutional dynamics that create and enforce ability grouping by performance. She emphasized the repercussion of the *students’* actions and framed the problem with the students not accepting tutoring as a problem of the students alone. In June, she highlighted this same comment: “Again, we have to remind kids that getting extra support is not a negative thing” (Revisiting reflection on mathematics teaching and learning, June 13, 2010).

In September, Brooke closed her initial reflection on mathematics teaching outlining the importance of a teacher’s positive reinforcement and students’ motivation for their learning:

The most positive thing that a math teacher can do on any level is to provide positive reinforcement. Math can be really challenging for students because a lot of it is very theoretical and hard to visualize. ... Teachers can help kids overcome confidence problems by tons of positive reinforcement. I think that many

teachers, especially as kids get older, forget how vital this is to the learning process. Working with second graders, you can see just how excited they get by receiving a few words of positive encouragement. In some situations where students don't get much support at home, this may be the chance that a teacher has to persuade a child to believe that they can do anything and that there are people who believe in their potential. (Reflection on mathematics teaching and learning, September 8, 2009).

Brooke specified her role in encouraging students' progress. In December, Brooke highlighted this paragraph and focused on her own relations with students: "I still agree with this paragraph about math teachers proving [providing] positive reinforcement" (Reflection on mathematics teaching and learning, December 1, 2010).

In June, she identified the essence of this paragraph as about student abilities and the importance of ability grouping: "This goes back to my earlier idea that teachers need to find positive ways to make students comfortable about their role in the math class hierarchy" (Revisiting reflection on mathematics teaching and learning, June 13, 2010). Brooke identified the math class hierarchy as important in her classroom and as related to positive reinforcement of students. She may associate ability grouping with positive reinforcement because she sees ability grouping as an opportunity to make mathematics less challenging or "less theoretical," which she mentions as a difficulty that students have with mathematics. It is unclear why she connects these, but her emphasis on the "math class hierarchy" and the importance that students understand their placement in it suggests how she sees systems of organizing students by ability as important for student achievement.

***Summary of Objective D.*** Across this objective, Brooke specified her teaching practice but did not identify problems of practice as suggested by other PSTs in conversations or generalize her concerns to problems of teaching or principles of practice. For example, Brooke specified her grading system and how she reported students' progress on report cards, but she did not respond to other PSTs' questions and concerns about the tensions of assessing student understanding or individual differences and grading in line with standards. Across the episodes where PSTs discussed and problematized teaching and assessing students, Brooke outlined strategies but did not situate these strategies within principles that guided her teaching. Brooke discussed problems of *students*, such as their lack of understanding about the "math class hierarchy," and her understandings of herself as teacher and teaching were related to how she understood ability grouping and used it to understand her students.

### **Discussion/Overview**

Across the objectives, Brooke's teaching practices were situated in pressures of test-based accountability. For example, she sought to focus her instruction on particular objectives and graded students in line with standardized assessments and reporting systems. As previously stated, these pressures are not unique to Brooke (e.g., Diamond & Spillane, 2004). Through the theoretical premise of performativity of identity, Brooke is positioned by the discourses about students and students' abilities, and this positioning shapes her understandings of teaching, both her current practices and what is possible, and her interactions with students,

Brooke described her positioning as an active process, in relation to others, but not as framed within social or institutional constraints or contexts. In many discussions,

she identified understandings of herself as a mathematics teacher and her teaching as independent of discourses of test-based accountability, and she struggled to make connections between the tensions addressed in vignettes or highlighted by other PSTs and her own classroom or her own teaching. Without identifying the multiple discourses at play or their implications, she did not have opportunities to critique these discourses or the relationships between and across interpretive frameworks (Martin & Van Guten, 2002).

In discussing her teaching, Brooke specified her teaching practice but did not respond to problems or principles of practice that other PSTs suggested. She spoke clearly and confidently about her obligation to use the standards on the report card and identified that the reporting system directed her assessment practices. Brooke identified both her desire to support all students as individuals with personal goals and the importance of grading all students on the same measures and grading objectively. However, she did not take up the tensions that are at the intersections of ideas such as supporting all students as individual learners and following standardized curriculum pacing or implementing ability grouping, and she dismissed others' concerns with these tensions. For example, when other PSTs highlighted tensions or problems of practice, Brooke seemingly resisted working at the intersections or critiquing current systems of grading students or evaluating their progress. In discussions, she identified practices for grading, but as her practices remained distinct and not consistently tied to principles, she did not create a framework for her to use to understand and build on when discussing her practice.

Brooke discussed and responded to problems of teaching practice as problems of *students* not understanding their abilities or the organization of mathematics class, for example, or not being “developmentally ready.” For example, she echoed the accountability systems in her school context, such as the reporting system and within-class ability grouping. Research suggests that these policies and systems influence teachers’ understandings of students and their abilities. Specifically, Horn (2007) described the ways in which teachers’ conceptions of students and their conceptions of mathematics “are encapsulated in the category systems embedded in the teachers’ everyday conversations with their colleagues and built into the curricular structures through which they view them” (p. 74). That is, for Brooke, the ways in which she understood students are produced and reproduced by and through her interactions with colleagues and structures such as curriculum pacing. Horn discussed how these category systems then influence the ways in which teachers problematize practice:

Because these category systems provide a vocabulary for fleshing out problems of practice, any solutions that emerge are informed by these underlying conceptions, providing a resource for teacher learning and for making choices about practice... Because of the role category systems play in modeling problems of practice they ultimately define an important part of teachers’ zones of enactment, delineating what seems possible... For example, if a category system explains students’ success or failure by ascribing them varying degrees of ability and motivation, it delimits a range of pedagogical responses. (p. 74)

Brooke, for example, may have struggled to generalize problems of practice to principles of teaching because of the ways in which she used the categories, such as “below-grade level,” “inclusion,” or “second graders doing third-grade math,” to explain her students.

Providing Brooke with opportunities to critique these discourses about students and test-based accountability systems more explicitly may have supported her in her stated interest in teaching all children. More focused experiences may have supported her in working at the intersections of competing discourses and in developing principled understandings of practice. As test-based accountability emerged as a salient theme across her participation, more attention to students’ status or the variation of students’ understandings within a category, the categories that are a result of the testing may have encouraged her to problematize practice (Horn, 2007), or as related to this study, shifting understandings of teaching.

Across the seminar sessions, Brooke did not demonstrate shifts in understanding herself or her teaching in relation to the institutional discourses of accountability or social discourses of students or their abilities. In a manner similar to Brooke and other participants, Sarah, the participant discussed in the next case, was positioned and positioned by these issues. Sarah however, engaged in the tensions and intersections, relating teaching all students with high expectations to her school contexts and the particular constraints therein. Across the sessions, her understandings of herself and her teaching shifted in a manner different than Brooke.

## **Chapter 6: Sarah**

Sarah is a White female in her early thirties. She grew up and lived in a nearby major urban center. Before beginning the ElCert program, she worked with children in dance and movement classes and did other managerial work. In Fall 2009, she described doing well in mathematics in elementary school even though it was not her favorite subject (Reflections on mathematics teaching and learning, September 6, 2009). She said that she had more defeating experiences in high school.

Sarah's internship was in a third grade classroom in an elementary school, Owl Creek Elementary, in Graverly County. Maya and Paige also interned at Owl Creek. Sarah was pensive during seminar sessions, seemingly engaged but sometimes reserved. She wrote at length in response to writing prompts, particularly at the beginning of the seminar. In our interview, she shared how she talked about our activities at home with her spouse, which also suggests how she was actively engaged and interested in our work.

### **Analysis of Sarah Across Seminar Objectives**

This analysis, structured by the four objectives, follows how Sarah negotiated her understanding of herself as a mathematics teacher and teaching as providing access and opportunities to learn mathematics within the institutional pressures around test-based accountability. Table 6 is a map of the presentation of the case in order to help the reader follow the episodes that are aligned with each objective.

This analysis reveals how Sarah was reflexive about the many ways she was positioned as a teacher and how she problematized teaching in a principled manner. Sarah examined her teaching context and her mentor in detail and she specifically

Table 6. Presentation of the case of Sarah by objective and analytic sections

Objective A	Objective B	Objective C	Objective D
Examining teachers' expectations and the implications for students' access to opportunities to learn mathematics (Session 1)	Analyzing the mentor-PST relationship and implications of how teachers position students on students and PSTs (Vision statement and Sessions 1 and 2)	Analyzing her positioning in context and repositioning herself as a mathematics teacher (Written reflection on sessions)	Evaluating practices of assessing students and communicating progress in response to school contexts (Session 4)
Identifying contextual constraints and pressures in mathematics teaching (Vision statement and Discourse prompt)	Repositioning herself in relation to her mentor (Session 2)	Critiquing discourses of mathematics and mathematics ability and the relations to mathematics teaching (Revisiting her mathematics autobiography and reflections on mathematics teaching)	Interrogating the multiple discourses that position teachers and teachers' options for practice (Portfolio presentation)
	Examining how teachers provide access to opportunities to learn mathematics (Session 3)		
	Examining teachers' positioning of students as related to students' career opportunities (Session 3)		
	Examining pacing pressures and grouping students by ability (Session 5)		



attended to how teachers' actions influence students' self-understandings and opportunities to learn. She repositioned herself in relation to prevailing institutional discourses through the manner in which she discussed her mentor, her own practices, and principles of teaching practice.

Specifically, the following principles of practice emerged in the analysis of Sarah across sessions:

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx).
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.
- *Principle 3b, Responding to students:* Teachers need to provide all students with access to opportunities to learn and make sense of the mathematics.

As presented in the following analysis, Sarah negotiated these three principles, articulating teaching practices and specifying relations between issues of access to opportunities to learn in mathematics specifically. Sarah also problematized teaching in ways that suggest shifting understandings of teaching, in particular regarding the role of mathematics content knowledge for teaching. Across the objectives, Sarah's understandings of herself and teaching shifted as she analyzed and interrogated the relations between issues of access to opportunities to learn and the institutional discourses of accountability that were present in her context.

**Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations.** In this section, I focus on how Sarah

examined issues of access and the institutional and social discourses of around measuring and evaluating student progress. These issues emerge in Sarah's understandings of teachers and teaching. In these episodes from Sessions 1 and in her written assignments after Session 1, Sarah identified the relational elements of teachers' positioning, the role of her context in how she understands students' success, and teachers' actions that positions students as capable or not.

*Examining teachers' expectations and the implications for students' access to opportunities to learn mathematics (Session 1).* During Session 1, PSTs read the vignette *Algebra for All* about teachers' negative reactions to a new state mandate that all 8<sup>th</sup>-grade students take Algebra 1 (Crockett, 2008). Teachers in the vignette suggested that some students would struggle with the "higher-level thinking" or did not need Algebra 1. In particular, Mr. Jones, a teacher in the vignette, said that some of his students were not capable of learning algebra and, specifically, he did not expect Rojelio to either succeed in Algebra 1 or use the mathematics in college or after college. The full rationale for this activity is discussed in Chapter 3; the full case is in Appendix C.

In reaction to this case, Sarah identified the low expectations that Mr. Jones had for his students and the implications on teacher practice:

Sarah: Does anyone know, has anyone ever heard the expression, like soft bigotry of lowered expectations? That's what that makes me think of.

Maya: Yes

Jill: Soft—

Sarah: [one laugh] soft bigotry of lowered expectations.

Jill: I like that.

Sarah: I know. I read it some place: soft bigotry of lowered expectations. When I read his comment, that's exactly what I thought. That's an example of it.

Jill: Okay, tell us more, because he

Sarah: It's to have such a low opinion of your students. That's bigotry and dehumanizing, and I find it really offensive.

Jill: Even though he's trying to be nice?

Sarah: He's not.

Candice: But that's because, he doesn't—that's why it's soft.

Josephina: He doesn't realize.

Jill: Okay, that's why it's soft because he doesn't realize?

Susan: It's that, yet, I think-

Candice: He's not being malicious or anything.

Sarah: I guess, I guess it's, kind of, is at that unconscious level. But I kind of feel like he should know better. He's a *teacher*.

Maya: Yes

Candice: How long has he been there?

Erin: 30 years?

Candice: 30 years? Like, 30 years of the same situation. I mean, our society is a mess right now. He probably had no contact with African-Americans or Latinos. So he only had what he saw in the movies or whatever. So he only had this perception, so he never had to deal with it, and now he's faced with it. And it's not even—it's probably unconscious. Because he's

just, he's always been that way.

Susan: But at some point, I think you kind of have to hold people accountable for their opinions because that, their opinions translate to their behavior, yeah, their work with their students. I just— (group discussion, March 23, 2010)

Sarah introduced the phrase “soft bigotry of lowered expectations” and defined it as having a “low opinion of your students.” She acknowledged Mr. Jones’ low expectations of his students in mathematics and found his comment to be offensive. Mr. Jones questioned not only *what* mathematics should be taught, but also *who* should be taught mathematics. Sarah did not specify whether Mr. Jones’ comment about his students being incapable of doing Algebra 1 or his comment about Rojelio not needing or using Algebra 1 was offensive, but she identified how he positioned his students as incapable of being successful in either Algebra 1 or in a career that required mathematics.

Sarah, more than other participating PSTs, was visibly irritated about Mr. Jones’ comment. Statements such as the ones made by Mr. Jones are representative of a view of mathematics as exclusive to particular students, a view which pervades school mathematics (e.g., Stinson, 2004). Sarah identified how the gatekeeping qualities of mathematics manifest in how certain students are allowed access to mathematics, where access is opportunities to take certain courses, to learn particular mathematics, or to participate in class instruction. Students, characterized as incapable, may be excluded from participating in mathematics and allowed limited access to quality, advanced mathematics. Sarah established that having high expectations of students’ abilities and possible career paths as related to mathematics, and, specifically, recognizing the gate-

keeping power of mathematics are critical elements of being a mathematics teacher and are more important than being “nice” to students. Sarah’s comments align with a principle of teaching response: *Principle 3, Responding to students*: Teachers need to provide all students with access to opportunities to learn.

In response to Candice, Sarah accepted that Mr. Jones may not have reflected on the implications of not including all students in Algebra 1, but she held Mr. Jones responsible both for reflecting on his actions and for his behavior. She did not excuse his behavior because he was not aware of it, but rather she suggested that his awareness of this behavior is critical to what being a teacher means. When Sarah said, “He should know better,” it is unclear if she felt that he should know better than to have low expectations of his students or than to restrict students’ opportunities to learn or future opportunities in mathematics. Sarah, however, included teachers’ reactions to and positioning of students in relation to mathematics as part of a teacher’s role in the classroom. Sarah, more than other PSTs, responded to the elements of the case that prompted me to include this vignette, such as the politicized nature of mathematics and mathematics role as critical filter (NCTM, 1989), particularly the relations to social discourses of low expectations of particular groups of students.

Sarah emphasized the relational and contextual elements of how he positioned his students and argued that there are implications of teachers’ opinions of their students and how his positioning of students surfaced in interactions with students (positioning as performance) and related to access to opportunities to learn. Sarah did not examine, however, how Mr. Jones was positioned and how prevailing discourses of race, class, or mathematics learning may influence his reaction or his low expectations of his students.

In this way, Sarah identified how he positioned *his* students, and not how *Mr. Jones* was positioned in relation to other dynamics. For example, as Candice mentions, how is Mr. Jones' reaction to Rojelio in response to social discourses that suggest that students of color cannot do well in mathematics? Or, how does Mr. Jones view mathematics learning? Is his reaction to Rojelio because he understands mathematics as a collection of discrete skills and dependent on prior performance and Rojelio's previous low performance as prohibiting his future success? It is also unclear whether Sarah was focused on Mr. Jones' low expectations of his students or the resultant lack of opportunities to learn.

***Identifying contextual constraints and pressures in mathematics teaching***

***(Vision statement and Discourse prompt).*** In her vision statement, Sarah shared her "hopes" for herself as a mathematics teacher (see prompt in Table 1, p. 77); more details in Appendix B):

As far as me as a math teacher, I am not sure where I see myself. I want to believe that I will be using problematic tasks and encouraging my students to explore and to question. And, I hope that I won't be skilling and drilling my students. I hope I won't be using mind numbing workbooks and textbooks. I hope my students are learning and growing in my classroom. I hope I continue to see them as unique individuals, not just as test takers. I hope I am still reflective and responsive to my students' needs. I hope that I am flexible and constantly strive to improve my teaching. I hope I am not stuck in a rut. I hope I haven't succumbed to the pressures of high stakes testing. And, I hope that I will think of

the administrators and other teachers at my school as allies, not adversaries.

(Vision statement, March 29, 2010)

Sarah stated her goal of “using problematic tasks and encouraging [her] students to explore and to question,” emphasizing students’ engagement in rich mathematics. She listed different “hopes,” as if they were prerequisites for this goal. In this manner, she identified that contextual elements may restrict her capacity for teaching mathematics or using problematic tasks and more generally the complexity of mathematics teaching in her current school context and the contextual influences on her positioning.

Sarah examined these particular institutional discourses of accountability in her written statement about how the different discourses and messages about students and teaching that we discussed in Session 1 were evident in her classroom and school<sup>31</sup>.

Sarah identified how teachers are positioned by institutional discourses of accountability, and particularly, by the state assessment: “Administrators at my internship appear to define success by test scores” (Discourse prompt, April 7, 2010). Sarah’s comment echoes research on institutional discourses of accountability and how education policies,

---

<sup>31</sup> During Session 1, I recorded PSTs’ responses about what they felt were influencing the teachers in the *Algebra for All* vignette (Appendix C). The list we created included “success as defined by test scores,” “teacher as ‘fixing’ kids in one year,” and “students as on a level/leveled” (group discussion, March 23, 2010). I described these ideas and the other ones listed as “forces outside the individual, structures of statements, that influence the individual, shape understandings and actions. Like, there are prevailing forces that are kind of framing teachers’ reactions.” I detailed why we were creating this list and defined a working definition of *discourses*:

Our goal is kind of to try to name these different influences or forces so we can see how they are influencing the actors here and really teachers and students more broadly. These influences are called discourses. Social, historical, political forces, they organize a way of thinking into a way of acting in the world. I wouldn’t say that all of these are influencing all of us, but what do you see? (group discussion, March 23, 2010)

I typed this list and posted it on the discussion board. After Session 1, I asked PSTs to respond a prompt about how these discourses or others influence their teaching, themselves as a teacher, or their students: “How do these discourses—the ones that we talked about in Session 1 and any others—influence your teaching, yourself as a teacher, or your students? Where do you see these discourses in your classroom now?”

such as No Child Left Behind (NCLB), “equate teaching quality and students’ learning with high-stakes test scores” (Cochran-Smith, 2005, p.101).

Sarah emphasized that test-based accountability systems and the administration’s focus on testing influenced teachers in her school context and led to teaching defined by test preparation for over ten weeks in the spring:

Benchmark test results and [state test] results are constantly discussed at staff meetings and grade level planning sessions. As a result, teachers plan lessons and teach students to prepare them for the [state test]. Test preparation is ongoing, but it was particularly emphasized following the winter break until the test in March.

(Discourse prompt, April 7, 2010)

Sarah’s comment is consistent with research about testing defining teaching and measuring of student learning (e.g., Cochran-Smith, 2005).

Sarah did not criticize teachers for their test-driven teaching practices or the ongoing test preparation. Sarah specified the limitations of using test scores to understand student learning and acknowledged that teachers can work within these institutional dynamics:

Despite [the test-based accountability pressures and emphases on testing], I believe most teachers value their success by the progress their students make throughout the school year. I have heard many teachers say [state test] scores do not really tell us what our students know and understand. I think test scores are merely a snapshot of my students’ mastery of isolated skills, not their understanding of a concept. At the end of the school day, I ask myself, “Did my students leave school today understanding a little more about themselves and the



world around them? Did I make a personal connection with each of my students?” And that is how I want to define my students’ success as well as my own. (Discourse prompt, April 7, 2010)

Sarah emphasized teachers’ responsibility both to prepare students for the standardized tests and to redefine success for their students. She repositioned herself in relation to discourses that defined student success by achievement scores by articulating the particular questions she used to measure student progress. She identified that her relations with her students are important and that she has some agency in choosing how she takes up the positioning by the institutional discourses of accountability. In this manner, she was reflexive about issues of accountability, identifying the implications for students and teachers, as well as how teachers, including herself, can actively position students as capable thinkers and individuals, resisting institutional pressures to focus on standardized testing or measuring abilities by a test score.

In this response, Sarah wrote about principles and practices of assessment that cut cross disciplines, and it is not unclear how she sees them as relevant to her mathematics classroom or how she sees herself as a mathematics teacher specifically. To address this, I prompted PSTs to add more specific details to their vision statements about exactly what I would see in their mathematics classrooms. I asked Sarah about the “hopes” that she listed, and for example, “What would it look like to encourage students to explore and question?”<sup>32</sup>. She responded to this prompt and detailed herself teaching language arts, mathematics, science, and social studies separately.

---

<sup>32</sup> Specifically, I asked Sarah:

Although you mention how it is difficult to see yourself teaching in 5 years, in the end, you put out some interesting “hopes”. Building from these, pretend that you are teaching and it’s a typical day in mid-October. Pretend that I’m coming to visit your class. What am I going to see exactly in

Sarah discussed teaching mathematics for understanding through problematic tasks and emphasized the complexity of preparing students for standardized tests, identifying the contextual, relational, and in performance elements of her positioning of herself as a mathematics teacher. First, she said that she would “constantly incorporate number sense and place value into lessons” (Revised vision statement, April 17, 2010). This demonstrates that she felt number sense and place value were important to student understanding and could be woven across content strands of elementary mathematics. The particular emphasis on mathematics content is interesting because Sarah did not specify how Algebra 1, as a particular high school course, was important in how Mr. Jones was talking about his students. In this manner, Sarah illustrated that providing students’ access includes addressing particular conceptual understandings that undergird much of elementary mathematics, in addition to her earlier emphasis on admitting students into a particular course.

Sarah detailed when she will use problematic tasks and how she will provide opportunities for students to share their thinking:

My students will be working cooperatively through problematic tasks at least during two lessons each week. Students will routinely present their solutions and strategies. Again, I think students need ample opportunities to talk and explain their thinking. (Revised vision statement, April 17, 2010)

Sarah illustrated how she can position her students as active agents in their mathematics learning and the relational elements of her teaching. Through emphasizing students’

---

your classroom? What would it look like to encourage students to explore and question? What would it look like to see students “as unique individuals, not just as test takers”? How do you think that I might see this in your classroom? What am I going to see exactly in your classroom? (personal communication, April 16, 2010).

sharing of strategies and the importance of student talk, Sarah described mathematics learning as a process of “making sense” (Fuson, Kalchman, & Bransford, 2005, p. 217) of the mathematics, where learning mathematics is grounded in students’ understanding of the nature of the problem to be solved and built on students’ reasoning and strategy development. Sarah emphasized the participatory nature of mathematics *learning* and described mathematics *teaching* as process of engaging students in meaning making and providing students opportunities to share their mathematical understanding. She outlined using cooperative groups and problematic tasks in order to give students access to both the mathematics and each other’s thinking.

Sarah described specific teaching practices that she enacted in her internship: “As I taught students long division last week I constantly asked them to think about place value at each step. After they solved a problem, I asked them, ‘Is your answer reasonable? Why or why not?’” (Revised vision statement, April 17, 2010). Sarah underscored the importance of asking students questions, particularly about place value and reasonableness of a quotient in a division problem. These practices create opportunities for students to access the mathematics by building on students’ prior understandings and creating a foundation for understanding a division algorithm and the reasonableness of their answers. In this manner, Sarah expanded on Principle 3 and emphasized that access also includes students having opportunities to make sense of the mathematics: *Principle 3b, Responding to students*: Teachers need to provide all students with access to opportunities to learn and make sense of the mathematics.

By detailing her practices, she suggested that she felt that her practices were important and set herself apart from the mathematics teaching practices in her school

context. Schools, such as Sarah's, that emphasize standardized test performance do not consistently encourage student participation in mathematics (e.g., Valli et al., 2008), and they may emphasize algorithmic thinking, which does not include asking students about each step in a division problem or attending to place value in the manner that Sarah described. Sarah repositioned herself in relation to institutional discourses of mathematics teaching and identified relations across issues of access, content, and student participation as elements of her understandings of herself as a math teacher.

Sarah also specified the role of student assessments in her classroom and detailed how access to mathematics includes supporting students' mathematics learning and test-based achievement:

Of course I will spend time preparing my students for standardized tests. It would be unfair not to. They will need to take countless multiple-choice tests throughout their lives. But, this will not be the focus of most lessons. I will present them with multiple-choice problems periodically for morning work and homework. Some portions of my assessments will include multiple-choice questions. If it is mid October, I will be teaching weekly mini-lessons on test taking skills. And I will pick one or two sample questions to teach students to analyze questions.

(Revised vision statement, April 17, 2010)

Sarah acknowledged how standardized testing or the social and political implications of students' performance on these assessments position students, which is likened to the gate-keeping role of mathematics in students' success. Her emphasis on test-preparation practices is not consistent with her emphasis on mathematics as a process of making sense. She identified distinct practices for supporting test achievement and suggests that

mathematics teaching for making sense and the practices she outlined earlier do not prepare students for standardized assessments. She also described using multiple-choice problems for morning work, homework, and assessments, and teaching test-taking skills and asserted that she would not want to focus on multiple-choice tests. Sarah acknowledged that the context within which she assessed her students defined acceptable assessments and practices and that there are social implications of students' performance in mathematics; that is, she identified the relational elements of how she and her students are positioned by institutional discourses of accountability and how this positioning is present in her classroom and instructional practices (positioning as performance).

Sarah also specified how standardized assessments influence students' own self-understanding:

I will not display results of standardized test on my walls. I will not make public announcements about some students testing "basic" on benchmark assessments in order to motivate my students. Instead, I will display my students' work on the walls and I will praise their accomplishments. (Revised vision statement, April 17, 2010)

Sarah alluded to her mentor teacher's practice of publicly displaying and announcing students' grades or performance level—basic, proficient, and advanced are the designations used on Graverly county report cards—as a means to "motivate [her] students." Sarah detailed how she will display students' *work* as opposed to test scores and position her students as mathematically capable. Her mentor's practices related to restricting opportunities for students to learn, and she proposed an alternative practice of

motivating and communicating with students, being reflexive about her positioning and repositioning *herself* in relation to institutional discourses of accountability.

***Summary of Objective A.*** Across the episodes in this objective, issues of access and opportunity, as well as institutional discourses of accountability, emerged as critical to Sarah's understandings of herself as a mathematics teacher. Sarah articulated how issues of access manifest not just in who is included in which mathematics classes or who can take Algebra 1, but also in how teachers interact with and teach students. Access to opportunities to learn included presenting content and material in way that all students could respond to and engage with the mathematics, students' learning opportunities are influenced by grouping, how content is presented, or type of teacher questioning. She emphasized that how teachers understand and talk about students also has implications for students' access to opportunities to learn. She described teaching practices that provided students with access to opportunities to learn mathematics, prepared them for standardized assessments, and supported their self-concept. Although she distinguished between mathematics teaching and standardized test assessment, Sarah did not accept that she has to measure students' *progress* by the state assessments, rather she noted that students need access to the content of the assessments. She was reflexive about her positioning in relation to these critical issues, but she did not consistently describe herself as agentic in teaching in a manner that subverted her positioning.

**Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.** In the following episodes from Sessions 1, 2, and 3, Sarah demonstrated attention to the implications of prevailing institutional discourses on

teaching, students, and teachers. Across these episodes, she was reflexive about her positioning towards issues of access and also problematizing teaching.

*Analyzing the mentor-PST relationship and implications of how teachers position students on students and PSTs (Vision statement and Sessions 1 and 2).* In her initial vision statement, Sarah explained how her experience with her mentor had implications for her teaching and how she positioned her students.

For the past six and a half months, I have been greatly influenced by my mentor's teaching within her classroom. And I wonder, am I bullying and manipulating my students into compliance? I find myself saying or doing something in front of my class that makes me ask myself, "Who is this talking? Where did that come from? Have I become that teacher? Have I become that teacher who is willing to humiliate a student to teach a lesson to the rest of the class? Am I that teacher who kids themselves in thinking that it is for the good of the class? Have I turned into my mentor?" (Vision statement, March 29, 2010)

Sarah defined her mentors' practices as "bullying," which highlights the negative implications of her mentor's words and actions on students. She problematized her mentor's practices by presenting particular details of her mentor's teaching and situating these actions as part of a broader category of actions, where her mentor is assuming power over her students and reasoning about the "good of the class." She recognized how she had taken up her mentor's practices and expressed shock and even disgust that she had become a teacher who would humiliate students or reason that humiliating students was acceptable.

Sarah did not take this as an opportunity to continue to criticize her mentor or her mentor's practices. Instead, she identified the relational, contextual elements of how *she* was positioned and how *she* positioned herself:

At the start of my internship I spent a lot of time judging my mentor. I focused on her teaching in terms of her faults. I kept thinking, "I am going to do this so differently next year." At some point, I stopped judging her teaching because I saw our students learning and making progress. They were learning. So, I decided to stop judging her and start learning from her instead. I raised my volume level when she told me to "use my voice more." But, now I feel like I spend too much time yelling and raising my voice to control our students' behavior. They are kids! They get loud and excited. (Vision statement, March 29, 2010)

Sarah described how she reflected on and evaluated her mentor's practices, envisioning herself engaging in different practices in her own classroom next year. She identified a turning point, where she ceased critiquing her mentor's practices because she saw her students "learning and making progress." In this manner, Sarah described how she was positioned first by her mentor and then by her students' progress. She acknowledged that she attributed her students' learning and progress to her mentor's observable practices, such as her mentor's yelling and the ways in which she controls students' behavior. Sarah acknowledged that her students' achievement influenced how she then chose to position her students and how she understood her mentor's teaching practices. Access, as related to success in mathematics, and opportunity to learn are important to Sarah, and her practices align with a principle of providing all students with access to opportunities to learn (Principle 3).



In this way, Sarah asserted that there was a relationship between her mentor's yelling and her students' learning, suggesting that her students were learning when her mentor was yelling, but she did not articulate the connection between how *her mentor* is positioned and why she yells. In a similar manner, Sarah did not identify how Mr. Jones was positioned when discussing his actions or relations with his students. In other written responses (such as in her Discourse prompt, April 7, 2010), Sarah described how accountability pressures influence teachers' instructional practices, such as the student tasks and the materials they use, and thus, it is noteworthy that when discussing her mentor's practices here, Sarah did not yet articulate a connection to how her mentor is positioned and why she yells.

In Session 2, Sarah made a similar comment about her mentor in response to the case of Angela, Mrs. Carlton and Benjamin, but she was more specific about her mathematics teaching. This vignette of Angela, Mrs. Carlton and Benjamin (Appendix D) raised issues of race and class, institutional pressures of accountability, as well as Angela's positioning as an intern (the rationale for using this vignette is outlined in Chapter 3); Sarah related her own teaching and the implications for students learning to this vignette.

In our discussion, I asked if anything "bothered" the PSTs about Angela's response to Benjamin or how she engaged in her internship. Sarah detailed what Angela was *not* doing and made connections to her mentor's mathematics teaching, her own experiences as an intern, and herself as a mathematics teacher:

Well, also, too, she saying, "Angela had become accustomed to the complaints Mrs. Carlton aired during morning recess." So, she's, pretty much, just, just being

like a soundboard for Mrs. Carlton's venting. So, at some point, like, I don't know, like, she's not helping her mentor change if she's just listening, you know what I mean, and not challenging her. And, because I found I kind of fell into that role with my mentor, and I think that caused some issues with me. I think, where, I just didn't say anything, and I just kind of went along with things and now I find myself yelling at my students and I'm kind of like, "Who is this? Why am I yelling? I should not be yelling at them. They're, they don't get long division yet!" You know, but I just, I feel like, I feel my mentor, like, I don't know, I feel her, I feel her voice like when I, when it's, but it's like "Is that me?" because I used to not be like a yeller. (group discussion, April 27, 2010)

Sarah emphasized that Angela did not react to her mentor's complaints about students' inappropriate behavior and incomplete assignments. She felt that by not reacting, Angela did not contest either her positioning as an intern or Ms. Carlton's positioning of Benjamin as incapable. Sarah emphasized that it was important that Angela encourage Mrs. Carlton to change first because of the change would support Mrs. Carlton and her students. Also, Sarah felt that without acting, Angela may go along with her mentor's practices or be positioned by the same social and political discourses that position Mrs. Carlton's reactions, as Sarah's own experiences of not challenging her mentor or going "along with things" led her to take up her mentor's instructional practices and style. Sarah described challenging her mentor as both an active process of talking with her mentor and also a personal process of reflecting and subverting positionings.

Sarah's response was similar to her written vision statement, but she situated her response in her mathematics teaching. In her vision statement, Sarah referenced raising

her voice; in this comment, Sarah portrayed herself as yelling when teaching division specifically, a practice she took up from her mentor. She acknowledged that yelling does not support students' learning and thus is not an appropriate response when students do not "get division yet." Analysis suggests this vignette in particular provided an opportunity for Sarah to specify her understanding of herself as a mathematics teacher and how she positions her students. Sarah critiqued her practice of yelling at her students and problematized her mathematics teaching, identifying that her students' lack of success with her activity may be related to students' understanding, which would not be improved through her yelling. She recognized how particular actionable steps or classroom practices do not align with her principles of providing students access to mathematics or opportunities to participate in mathematics as a process of sense making (Principle 3b). Sarah did not reference that her students' progress influenced her own practice, which she mentioned in her written statement; that is, she did not address issues of access in relation to mathematics test *assessment*, but rather addressed providing students opportunities to learn division and responding to her students' thinking in her classroom.

In addition, Sarah problematized mentor-intern relationships by specifying what actions Angela could take with her mentor. Sarah could have taken up an opportunity to complain about her mentor or engage in "gripe session" (Horn & Little, 2010, p. 202) about her mentor's practices, likening her to Mrs. Carlton. Instead, Sarah addressed the complexity of the mentor-intern relationship, how she was implicated in this relationship, and how this relationship had been important for her in better understanding herself and her reactions. Sarah specified the strategies that she could have used, such as challenging

her mentor, and how these strategies could both “help her mentor change” and support her in critically examining her practices. She did not detail how she could challenge her mentor, but she maintained that both she and Angela have agency and could reposition themselves in relation to their mentors’ practices. By connecting her practices to her mentor’s influence, Sarah generalized Angela’s feeling and the implications of Angela’s lack of action to how she felt that she took up her mentor’s practices without reflection. Sarah implied that without challenging her mentor, Angela might also find herself taking up her mentor’s practices.

***Repositioning herself in relation to her mentor (Session 2).*** After Session 2, Sarah responded to the prompt about her positioning as mathematics teacher in her classroom (listed in Table 1, p. 77; detailed in Appendix B). In her response, she highlighted her relationship and her mentor’s relationship to mathematics, her relations with her mentor, and her mentor’s positioning by accountability pressures. Sarah first described what she does when her mentor is teaching mathematics:

In my mentor’s classroom, I feel positioned as a second set of hands and eyes during lessons. My job is to circulate in the room as make sure students are staying on task. Sometimes I jump in when my mentor is teaching. In these situations I feel like I am positioning myself as a questioner of my mentor’s mathematical knowledge. I stop to pose a question to her and to our students. Sometimes I feel like I am stepping on her toes because I catch her mistakes or question how she explained something. She can be very narrow in her explanations as she focuses on procedural knowledge and expects our students to solve problems the way she taught them. I have learned to be considerate and

diplomatic as I position myself as such. I have found it more effective if I play dumb as I question her. Then, I follow up each incident with justification of her position and a compliment but at the same time she acknowledges that there may be another way to look at a problem or another way to explain its solutions. This is really manipulative on my part, right? (Positioning prompt, May 10, 2010)

Sarah described her mentor's narrow explanations, focus on procedural knowledge, and the manner in which she "expects our students to solve problems the way she taught them." She presented an alternative view of mathematics learning when she explained how she posed questions to both students and her mentor and offered alternative explanations. She positioned herself as a mathematics teacher in contrast to her mentor and her mentor's practices by including these practices as important elements of mathematics teaching.

Sarah detailed how she engaged in repositioning herself as different from her mentor and how she did so diplomatically. For example, Sarah explained how she would interrupt her mentor to "pose a question to her and to our students" and "catch her mistakes or question how she explained something" (Positioning prompt, May 10, 2010). She explained justifying her mentor's answer and then identifying an alternative solution or explanation. In this manner, Sarah contested how her mentor positioned her students in relation to mathematics and her as an intern, but she emphasized that being considerate was important. Sarah called her actions "manipulative." Analytically, these actions suggest that she was working difference (Ellsworth & Miller, 1996) and repositioning herself in relation to mathematics teaching. Sarah detailed both her teaching practices *and* the discursive moves that she enacted to reposition herself.

Sarah introduced the contextual and relational elements of her positioning and how repositioning herself in relation to her mentor's mathematics teaching was difficult because of the accountability pressures that she and the students feel: "The problem is that I have grown to trust and respect my mentor. I really like her and I think she has the best interest of our students at heart. But, she is really focused on developing their test-taking abilities and not their critical thinking skills" (Positioning prompt, May 10, 2010). Sarah identified that her mentor was in a particular context, which influenced her mathematics teaching and her emphasis on test-taking skills over students' critical thinking skills.

Sarah suggested that being an intern allowed her the opportunities to reposition herself in relation to her mentor's mathematics teaching:

I think I get away with questioning her because I defer to her constantly in most other subjects. Frequently in language arts, I position myself as her assistant. She knows more about teaching reading than I do. Still other times, I have taken the lead on lessons and positioned myself as a leader on less pressing projects in the classroom. (Positioning prompt, May 10, 2010)

Through positioning herself as an "assistant" in other disciplines, Sarah created the opportunity to question her mentor's teaching in mathematics and reposition herself in relation to mathematics teaching. In this manner, Sarah identified the relational elements in her positioning and how her relationship with her mentor afforded her opportunities to position herself as a leader or as a questioner in mathematics but not in all disciplines.

Different from her statement written after Session 1, in this written response, Sarah identified her mentor's positioning by test-based accountability and how her

mentor's practices aligned with the students' tests and her mentor's interpretation of how to be prepare students for them. She recognized that her mentor did not create opportunities for students to do critical thinking in mathematics, but she related this to her mentor's positioning by the pressures of test-based accountability and her mentor's understanding of mathematics. She did not make associations between her mentor's positioning by accountability pressures and her manner of interacting with students, which she emphasized in her earlier reflections on her mentor's classroom management style.

***Examining how teachers provide access to opportunities to learn mathematics***

**(Session 3).** In Session 3, Sarah emphasized teachers' positioning of students in her analysis of transcripts and interviews of Teacher A and Teacher B (the full vignette and prompts are in Appendix E). Interrogating these lesson segment transcripts and interviews provided PSTs with an opportunity to relate teachers' positioning of students in both the transcripts and interviews to the teaching of mathematics, specifically to identify the language teachers are using to position students and investigate how the teachers are being positioned (the full rationale for this activity is included in Chapter 3).

In the lesson transcripts, Teacher A wrote the definitions of the terms range and domain on the board and was direct in his approach. Teacher B was less specific in his language and addressed his students and the mathematics differently, using "we" and "you" and suggesting a more casual, conversational approach. After reading the transcripts, participating PSTs appreciated the more conversational approach of Teacher B. For example, Norah noted that Teacher B said, "That's what *we* are going to have a look at today" and suggested that Teacher B's use of the word *we* denoted how Teacher B

was communicating with his students and engaging them in learning mathematics. Sarah also identified with and analyzed the particular language of Teacher B:

And he uses it, or uh, the teacher up--on the first one, he talks about it and he says, "There is only one, one and only on. We cannot have a zero, blah blah blah blah." It just seems very, like, "This is it and that's how it is." And then the other one is like, *you* will, *you* notice. You know, so he's talking to them directly and not talking at them. (group discussion, May 11, 2010)

She suggested that through his use of the word, "you", the active verbs, and future tense, Teacher B included students in *doing* the mathematics. Sarah contrasted Teacher B's language with Teacher A's language and interpreted Teacher A's comments about the definitions as saying "that's how it is." She identified relational elements of mathematics teaching and how Teacher B's language could support students in engaging in mathematics.

Sarah's comment is also evidence of problematizing mathematics teaching. She suggested that Teacher B's language included students in doing mathematics and described a particular actionable step as related to the principle of giving all students access (Principle 3) and including students in making sense of the mathematics (Principle 3b). Sarah valued mathematics as a process of making sense and students' engagement in mathematics and did not appreciate how Teacher A presented an absolute view of mathematics and did not use language that she felt involved students in thinking about mathematics. By Sarah describing Teacher B's language as providing students with access to mathematics, she illustrated how the gatekeeping qualities of mathematics were present in both who is allowed access to mathematics material and also how it is



communicated to students in a classroom (Principle 3b). Even though Teacher A and Teacher B were both discussing domain and range, Sarah argued that students in Teacher B's classroom were offered different opportunities to engage in the mathematics, and Teacher B's particular discursive moves were important for allowing students to participate in learning mathematics.

*Examining teachers' positioning of students as related to students' career opportunities (Session 3).* PSTs read transcripts of interviews with Teacher A and Teacher B after discussing the lesson transcripts (Appendix E). Teacher A portrayed his teaching as preparing students for future careers in mathematics and emphasized his responsibility to do so. Teacher B described his students' perceptions of the need for mathematics in their future and emphasized the importance of consumer mathematics for his students. Before we began our conversation about the interviews, Sarah turned to Paige and said, "Flipfopped," referring to how the high expectations and inclusive language that she saw in Teacher B's lesson were reflected in Teacher A's interview and how the language of low expectations and the lack of support for all students to learn that she saw in Teacher A's lesson was reflected in Teacher B's interview. Sarah did not elaborate further on the relations between Teacher B's lesson and his interview or make other connections to mathematics teaching.

In our discussion about the interviews, participating PSTs interpreted Teacher B's comments in different ways. They discussed *who* said "I'm never going to need math in the future because all I want to do is selling or be a check-out girl" (de Freitas & Zolkower, 2009, p. 197); that is, did Teacher B say this or was he repeating his students? Melanie, Sarah and other PSTs took the position that Teacher B was making a judgment

about his students' future careers and how they will be check-out girls, while Brooke, more vocally than others, did not agree that Teacher B was saying this:

Melanie: By repeating it, in this manner, he's kind of saying, "I agree."

Yeah, he's not, I don't feel like pushing back.

Brooke : See, I don't see it that way at all.

[Melanie shrugged]

Brooke: I think he's just repeating what he sees them feeling, and saying, "Okay, well if that's the direction you go, you still need math. So whether you want to become a scientist or whether you want to be a check-out girl, you're still going to need math." I think that's kind of his point

Michelle: What does it mean when it says, "Because all I want to do is selling"? What is, what is that?

Sarah: Sales. I think working sales, which anyway, just sales would be a check-out girl. I don't see the difference, I don't see that there is any sort of, um, push for an actual career—

Brooke: Really?

Sarah: like a long-term sort of professional development, you know when you think of someone's career, I don't know.

Brooke: But these are the girls' attitudes, not his attitudes.

Sarah: But he's saying it, it doesn't matter. (group discussion, May 11, 2010)

Melanie asserted that whether Teacher B's students said this or not, by repeating it, Teacher B was reinforcing his students' career paths as check-out girls, and Sarah agreed. Sarah asserted that neither the terms "sales" or "check-out girl" suggested that Teacher B thought about his students as having professional careers and, instead, revealed his negative opinion of his students. She struggled to define "actual career," and with this "rough draft talk" (e.g., Horn & Little, 2010, p. 195), it is likely that Sarah did not want to criticize the job of a check-out girl, but wanted like to indicate that Teacher B was not encouraging students towards a profession.

Sarah used this information in the interviews to emphasize additional interpretations of access to mathematics, specifically that access to mathematics concerns both how teachers present mathematics and how teachers exclude students from advanced mathematics or careers with mathematics. She asserted that in Teacher B's comment, where there is not a "push for an actual career," he was not encouraging his students to pursue or not providing opportunities for them to pursue career advancement. Sarah did not attend to Teacher B's lack of attention to advanced mathematics and emphasis on consumer mathematics, but spoke generally about the limited access or support that he provided.

Sarah emphasized that the manner in which he understood his students was apparent to her whether he called his students check-out girls or was revoicing what they said about themselves. Consistent with her comments about both teachers' lesson transcripts and their pronoun use, Sarah asserted that Teacher B's words matter and these interactions with students are important in mathematics teaching as related to access to opportunities to learn (Principles 3 and 3b). She emphasized that by authoring the

comment about his students as check-out girls, Teacher B expressed low expectations of his students' future career opportunities and was not providing support or access for career development. This is also consistent with what she felt was the offensive manner in which Mr. Jones suggested his students were incapable of doing mathematics and not going to use mathematics later. Sarah did not identify how Teacher B or Mr. Jones were positioned by social or political discourses of mathematics or mathematics teaching or how these discourses or their particular teaching contexts influenced their comments.

Sarah's explanation of Teacher B's comment led to an interesting exchange between Sarah, Brooke, and Laura:

Laura: This is their idea. He's like just quoting them, I guess.

Sarah: Is it his, is it his place to—

Laura: It's in the second part where I think that he's not pushing back, not in the first part. In the first part, he's just saying, like this is their idea

Brooke: Yeah

Laura: It's then, that he says, that's fair enough and he's—um but even if this is what they are going to be, they're going to need math, he's not pushing, he's not going another step further and saying they need math and they can be more.

Jill: What were you going to say Sarah? Is it his what?

Sarah: I can't remember. (group discussion, May 11, 2010)

Laura offered her interpretation and Brooke agreed. Sarah interjected but was interrupted. Sarah could have been asking if it were Teacher B's place to speak for his students or more specifically suggest a certain career path for his students or exclude

certain students from certain careers. Sarah identified the relational elements of both how Teacher B's language in his teaching positively may allow students access to mathematics in his classroom and how his language in his interview restrict opportunities, but she did not address Teacher B's emphasis on *consumer* mathematics.

***Examining pacing pressures and grouping students by ability (Session 5).***

Sarah's problematizing of teaching in relation to issues of access continued in Session 5 after we viewed Mary Hurley explaining her teaching situation in a fourth/fifth grade mathematics classroom in California (Appendices F and G). The goal of this session was to support PSTs in problematizing teaching and exploring how teachers can negotiate the institutional dynamics of accountability (Full rationale for this session is in Chapter 3).

In response, Sarah described the pacing pressures that teachers in her school felt and how there is a complex relationship between curriculum pacing, grouping students by ability, and the accountability pressures felt by teachers and students:

At Owl Creek, all of the above and on grade level are in my class in the third grade. And there's one [class] that's kind of a mixed class and then the other two are really below. And the below, the two classes that are the belows are always behind, and we just took a benchmark assessment for May and the other teachers, the teachers who teach the below are like, "My kids just—the division problems, they're not gonna get them. And this problem, they're not going to get them! And fractions, and blah, blah, blah, blah." And they're going on, and on, and on, and the two teachers are like, "We did stuff in class. The kids have been exposed to it, but they didn't have enough understanding to be successful, to do those problems." So that's a struggle that like I saw in my internship this year. On, like,

every time we hit, had those benchmark assessments, the teachers who were teaching those below level classes were just struggling and they were concerned about how it was going to look for the school, if the kids were going to do well on the MSA eventually, you know. (group discussion, May 25, 2010)

Sarah described the specific realities of ability grouping, pacing, and high-stakes testing in her context and how teachers struggled with this pacing and testing in different ways. Teachers felt pressure to keep pace with the curriculum and the benchmark assessments to support both students learning and performance and also discussed how their students' performance reflected on the school and potentially impacted their job or how they are perceived as teachers.

Sarah discussed how accountability pressures position teachers in a manner that is different than how she discussed Mr. Jones. Mr. Jones was “not being a teacher” because of his low expectations and how he was limiting students' opportunities to learn. In her reaction to Mary and the teachers at Owl Creek, Sarah was concerned about the students and their success, as well as the teachers. She identified the institutional pressures of pacing and accountability in relation to how these teachers understand their employment and the schools' image or accreditation; Sarah did not respond when these pressures were outlined in the *Algebra for All* vignette (Appendix C).

In response to Sarah's discussion about Owl Creek above, Candice asked, “How did you feel about grouping all of the kids together?” Sarah took in and let out a deep breath, and leaned back in her chair:

Candice:       Because our third grade is like that also and it's just-

Sarah:           I don't know, I think it's-

Candice: Would it be better if they were mixed together?

Sarah: I don't know. I think it's better if they're mixed, particularly at first, second, third, fourth, the younger kids. Um, but I, I was always in mixed classes when I was growing up so that's kind of what I was used to so, I don't know, I mean— (group discussion, May 25, 2010)

Sarah made three important discursive moves in this comment. First, she presented the complexity of how to teach and test students of differing mathematical abilities, rather than a solution, thereby normalizing this problem of practice. Sarah introduced her own experiences and specific grade levels using rough draft talk, such as “I don’t know,” and the phrase, “um, but I... so I don’t know,” which suggest how she was negotiating the different implications and influences on her understandings of practice. Sarah also presented her experiences as a learner and identified how they might influence her understanding of how to address this situation. Analytically, she was reflexive about her positioning towards these practices by identifying the contexts, relations between other factors, and her own histories.

Melanie then interrupted. She added that grouping students by ability allowed her to challenge some students and focus her instruction so students were not “bored” (group discussion, May 25, 2010). Melanie was unsure however if these benefits outweighed the costs, in particular how grouping influenced students’ perceptions of themselves as mathematics learners: “How is it affecting those students who are completely aware that they are in the below class? Even the students who know they're in the above class....they're getting these big heads in third grade and they're going to hit tough

times.” Melanie described how students position themselves in relation to their mathematics learning and understanding in response to grouping and questioned whether the teacher’s ability to “focus the instruction” was worth the influence on students’ perceptions of themselves as mathematics learners.

Sarah took up elements of Melanie’s problem, but also emphasized how curriculum pacing influenced teachers’ practices of grouping students:

I think too having those pacing guides and being kind of forced to use materials really boxes teachers in because they're not going to go out and plan these really engaging and dynamic lessons for all the diverse learners in their class if they have this textbook that they're supposed to meet, these benchmarks. It's just, they're, it's just too much, um. I think that they're really just boxed in. (group discussion, May 25, 2010)

During our sessions, Sarah did not typically engage in multiple turns in a conversation; her continued participation shows her high degree of engagement in this conversation and problem of practice. Sarah first agreed with Melanie about the influences on students, saying, “I think too,” and then she identified that the pacing guides influences teachers also by limiting their instructional practices. Because of the pacing guides, textbooks, and institutional pressures, Sarah suggested that teachers do not move to create dynamic lessons or attend to the diversity of student understandings in a classroom and then grouping students by ability is necessary in order to provide opportunities to learn for students. Sarah specified that the accountability pressures influence teachers’ organization of their students and also the rigor and opportunities for students to learn mathematics.



Across this episode, Sarah responded to different elements of grouping students and its relation to the rigor of the mathematics instruction that students receive. She identified how the pacing guides and textbooks limit teachers' instructional choices and make it difficult for teachers to design and enact lessons that reach all students. This attention to the mathematics is a shift from her comments about Teachers A and B where she focused more on their language and pronoun use in particular. In this response, Sarah also describes how pacing guides and grouping students relate specifically to differences in the content and rigor of mathematics instruction.

***Summary of Objective B.*** Across Sarah's responses to this objective, she focused on the implications of teachers' moves in relation to students' access to opportunities to learn mathematics and emphasized the teacher's role in providing access to opportunities to learn through their specific language, teaching styles, and mathematics included in the lessons. She identified how a principle of access to opportunities to learn (Principles 3 and 3b) intersected with the accountability pressures that she and teachers in her context feel. Sarah problematized teaching by identifying implications of accountability pressures for teachers, students' learning, and students' self-understandings as well as by specifying specific teacher language and teacher moves that relate to student learning and access to opportunities to learn.

**Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher.** The episodes related to this objective present the ways in which Sarah repositioned herself in relation to the prevailing social and institutional discourses that she identified in her context. In

particular, she identified how accountability pressures influence teachers' understandings of mathematics teaching and she repositioned herself in relation to her mathematics teaching. Sarah discussed how she understood mathematics teaching now as less about content knowledge and more about providing opportunities for student to build their own understandings.

*Analyzing her positioning in context and repositioning herself as a mathematics teacher (Written reflection on sessions).* After Session 4, I asked PSTs to “reflect on our work so far.” This assignment served both to create an opportunity for PSTs to reflect on our meetings and to guide my facilitation of the last three sessions. Sarah responded to each of the specific guiding prompts, which were, “Have these meetings helped you think about mathematics teaching or yourself as a mathematics teacher? If so, how? What have you learned so far about yourself as a mathematics teacher? What do you have questions about?”

Sarah discussed how the meetings have supported her self-reflection and what she has appreciated:

The meetings helped me reflect on myself and my positioning as a teacher. I feel like the conversation veers away from mathematics to the social context in which teachers teach. When we talked about math pacing guides in California, it reminded me that teachers teaching in a public schools are suppose to follow pacing guides. They are a reality. We are supposed to teach specific content at a specific level at a specific time in every subject. We have curriculum. And our students are given standardized assessments based on that curriculum. Falling too

far behind is a disadvantage to some students while plowing forward puts others at a disadvantage too. (Reflection on our meetings, May 27, 2010)

Sarah took up the word “positioning” in her response; although it is unclear what elements of her positioning she identified or critiqued, her use of positioning more broadly suggests how she is thinking of herself as a teacher as existing in relation to others and her context. In positioning theory (e.g., Davies & Harre, 1990; Harre & Van Langrove, 1991), participants continually construct or position themselves in interactions, and Sarah’s use of the word “positioning” suggests how she was understanding herself as positioned, and potentially, also as comprised of multiple positions that are constructed in interactions with others and contexts.

Sarah made a distinction between what we are talking about and teaching mathematics, but she discussed Mary’s narrative and standardized assessments specifically, both of which were about mathematics teaching. It is unclear what Sarah meant with this distinction or how she related mathematics teaching to the social contexts, but she detailed these contextual elements of teaching, the “reality” that teachers face, such as the institutional pressures of pacing guides and how they move instruction towards the standardized assessments. This is consistent with how she understood her mentor’s practices as related to test-based accountability pressures but she introduced more specificity, such as how instruction dictated by pacing guides disadvantages different students. Sarah said that the seminar “forced me to think about things I would not have thought about.... Also, the group has raised some interesting questions. I like hearing their perspectives, which are usually different than mine” (Reflection on our meetings, May 27, 2010). In this manner, she identified her self-

reflection and how she has listened to and used PSTs' different perspectives in understanding herself and negotiating her positioning.

Although Sarah suggests that the conversations in our seminar “veer away from mathematics,” she discussed her mathematics teaching practice in specific terms and in contrast to her mentor's mathematics teaching practice:

I have learned more about the type of teacher I don't want to be. I see my mentor struggling with math sometimes (She makes mistakes, but I know I make them too). Math is her favorite subject to teach. My mentor is reluctant to assign students problems from our Problem Solving workbook that is published by the textbook company. A lot of the problems require multiple steps and students have to apply several different math skills and concepts to solve them. Sometimes she has trouble solving them and/or cannot fully explain how to solve them to our students. I do not want to be like my mentor in that regard. (Reflection on our meetings, May 27, 2010)

Sarah admitted that she made computational mistakes, but she felt that how her mentor struggled with the mathematics material prevented her from engaging students in multi-step problems. Sarah identified how a teachers' mathematics knowledge for teaching influenced instructional practices, their explanations, and more generally, the opportunities for students to engage in rich mathematics. Sarah specified that she would like to engage students in explaining their work and in problem-based activities and how content knowledge would support her in this. Sarah also positioned herself towards a perspective of teaching mathematics as active engagement in problems that have multiple steps or include applications of different concepts.

Sarah said that she wanted “to talk more about teaching math [in our seminar]” and described why:

It is the subject that I feel the least prepared to teach. I am scared that next year I am going to fall into the “worksheet trap”. I am scared that I will end up teaching using primarily direct instruction with a skill and drill, test prep mentality. I feel like I am surrounded by teachers who have fallen into that trap! (Reflection on our meetings, May 27, 2010)

Sarah may have been interested in actionable steps that I could have provided for negotiating mathematics teaching in her specific context. She was nervous about teaching mathematics and the manner in which teachers fell into “test-prep mentality” and enacted test-driven practices, such as worksheets. She did not present herself as unagentic, but specified that she would like to be prepared for mathematics teaching in this environment.

*Critiquing discourses of mathematics and mathematics ability and the relations to mathematics teaching (Revisiting her mathematics autobiography and reflections on mathematics teaching).* After Session 7, Sarah revisited her mathematics autobiography and reflections on mathematics teaching, an assignment that PSTs first wrote for their mathematics methods course in September 2009 (Appendix I) and revisited at the end of the Fall semester (Appendix J). She inserted additional comments about mathematics and mathematics teaching and was reflexive about how she is positioned and how she is positioning herself in relation to mathematics and her own mathematics understanding and teaching. Across this written reflection, Sarah examined and interrogated the implicit discourses of mathematics and students’ success in mathematics.

In her initial mathematics autobiography, written in September 2009, Sarah described her mathematics experiences and her successes in mathematics: “I did well in math throughout elementary school despite the fact that math was not my favorite subject.” After Session 7, Sarah highlighted the words, “I did well in math,” and inserted a comment: “I did well because I figured out how to play the game of school (Listen, do your work, don’t talk too much, raise your hand...)” (Revisited reflections on mathematics teaching and learning, June 13, 2010). Sarah noted that she engaged in the expected classroom behaviors and that these behaviors were valued and translated to how her performance in mathematics was measured as successful. She questioned her mathematical understanding and suggested that she earned high grades in mathematics not because of what she understood but because she “play[ed] the game of school.” This distinction is important because Sarah did not equate her high grades in mathematics class, the socially accepted measure of mathematics performance, with understanding mathematics, but rather with her adherence to the norms of the mathematics classroom. She identified that there are alternative definitions of “well in math” for her and for her students.

Sarah embedded two comments around, “Good mathematics teaching must begin with a deep understanding and appreciation of mathematical concepts.” In November 2009, she commented, “Do I know enough to teach elementary math??? After this class, I wonder if I do. I realize that my math understanding is limited. But I am working on it!” (Reflections on mathematics teaching and learning, November 30, 2009). After Session 7, Sarah added:

My mentor has no idea what she is doing half the time with math! It drives me nuts!!! She follows the curriculum and the scripted lessons to a tee. I have caught her mistakes so many times. Thankfully I had the courage to speak up. I had to do this diplomatically. I did not want to make her feel incompetent. This was really challenging. (Revisited reflections on mathematics teaching and learning, June 13, 2010)

Consistent with her comment in her reflections on our meetings, Sarah identified her mentor teacher as following the scripted lessons and making mistakes in her mathematics teaching and suggested that this shows that her mentor did not have the mathematics content or pedagogical knowledge that Sarah felt necessary. She implied that deviating from a scripted lesson requires additional mathematics knowledge for teaching. She also suggested that she had more mathematics knowledge than her mentor, actively positioning herself as mathematically competent in her mentor's mathematics classroom by speaking up and correcting her mentor.

Sarah also highlighted the statement from her original autobiography: "If a teacher has a deep understanding and appreciation of math, they will undoubtedly be able to plan fun, engaging, and effective lessons for all types of students," and commented:

I think that I will be a good math teacher precisely because I do not know everything! I do appreciate math and I am not afraid to say, "I don't know." My mantra that I repeat to my students all the time: "I do not know everything. Don't expect me to. If you do, you will be disappointed." (Revisited reflections on mathematics teaching and learning, June 13, 2010)

Sarah distinguished between mathematical content knowledge and mathematical pedagogical knowledge. She identified her positioning towards mathematics, not as an expert but as a learner. This is an important shift from her earlier comment about the importance of “deep understanding and appreciation of mathematical concepts” and her concern about what she did not know. Sarah described herself as a continual learner, how she would like her students to see her as a learner, and how she models to her students the importance of being a learner and doer of mathematics. Her comment, “I do not know everything,” emphasizes both a perspective on mathematics teaching and learning and a perspective on mathematics as a process of making sense, one in which she wanted to engage herself and her students in doing.

Sarah emphasized practices of mathematics teaching that align with a view of mathematics as a process of making sense. She highlighted the statement, “Teachers should incorporate group work activities in class, particularly [for] challenging problems,” and made two comments: “Yes! But it must be meaningful!! A teacher’s perception of difficulty may be different than her students. Group work must also be strategically incorporated into instruction” (Revisited reflections on mathematics teaching and learning, June 13, 2010). Sarah problematized group work, specifying that it must be a well-facilitated element of instruction that supports student engagement and not a management strategy. Sarah identified that group work has an important role in mathematics class and specified that seeing her students doing mathematics together was important to her, which aligns with a view of mathematics learning as participatory and her principles of access (Principles 3 and 3b). Analytically, she explored how she can enact this view of mathematics, both positioning in performance and repositioning.



*Summary of Objective C.* Across the analytic episodes related to this objective, Sarah responded to how institutional discourses of accountability frame mathematics teaching and students and identified ways to reposition herself and thereby provide students with access to opportunities to learn. Her response to how institutional discourses of accountability frame teaching was to continue to problematize teaching and recognize that while she cannot subvert all of the ways in which teachers and students are positioned, she could maintain a focus on access and opportunities to learn through particular mathematics teaching practices. She introduced specificity about mathematics teaching in her contexts and the particular pressures on her teaching. Sarah actively took up different positions towards mathematics teaching and learning, emphasizing her position as a mathematics learner and describing mathematics learning for her students as a process of making sense.

**Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.** In response to this objective, Sarah problematized teaching and also presented specific discussion of new teaching practices. Sarah described how grading and evaluating students in relation to how she would like to understand students as competent and capable is possible within her test-driven school context. She also articulated how she learned about herself and schooling through her internship process and how she understood her opportunities for her future classroom.

*Evaluating practices of assessing students and communicating progress in response to school contexts (Session 4).* In Session 4, our discussion of PSTs' classroom artifacts led to a discussion about grading. The discussion of artifacts was meant to

situate PSTs' conversations about themselves as teachers in their own practice and to support PSTs in connecting their practice to implications for students' learning.

Candice was concerned about grading students and specifically, how to balance supporting students in reaching mandated curriculum goals and supporting student's individual growth. Brooke identified that her school has a separate work habits grade, and Sarah explained how the work habits grade on report card is used to record and evaluate students' overall effort:

Sarah: Well, Graverly County has, like, a work habits grade, right, and they do a work habits grade. And also, too, um, I feel like that gets, that a lot of, time that—even though, it's not on that particular assignment, that's where my mentor always tells me that's where that goes. “Well you know, you really can't grade them on that. That goes for the work habits. That's a separate grade, you know,” You're looking at that as a separate thing, and not their work in, like, their big, you know, writing assignment or a big math assignment. So, I don't know. It's hard, it's difficult.

Jill: Is it, does it have to be separate?

Sarah: I don't think it should be. But that's the GradeMax [county-wide computerized reporting system] Graverly County way!

Jill: Right. So if your homework was pg 73, numbers 1-9 odd, right, the only answers are right, like, the correct numbers there, but if your homework was like, write an essay, you'd think there'd be, or, like how are there different ways to solve this, you'd think that there

could be a combination of those two grades. (group discussion, May 18, 2010)

Sarah did not find a general work habits grade valuable and would have preferred to recognize effort on an individual assignment. She felt constrained by the GradeMax grading program that is used for reporting only one grade for an assignment and summative grades on the report card.

In response to my comment, the conversation moved to address the purpose of grading (however, not as related to instruction or the nature of an assignment). Taylor suggested, “The purpose of grading is to give feedback to the kids” and described how a grade for accuracy and a grade for effort allowed her to communicate with students and encourage them both to work on particular skills or put more effort into their assignments.

Melanie then identified how parents do not focus on the effort grade, only the letter grade, which led Laura and Candice to ask about how to encourage students to reflect on and respond to their grades at all. Sarah shared a practice she used to communicate with students:

You have to give them opportunity. What I do a lot of times, with, as part of the morning routine, I don't give them morning work. Sometimes, if I'm handing back like a big writing assignment or something, I'll leave it on the reading group table, come and pick up your paper, read my comments, raise your hand if you have questions, and that's their morning work for the day. And you know, if you're monitoring and you're making sure they're not chit-chatting and they're you know staying on task, I've found that that's helpful. My mentor thinks it's a waste of

time, she thinks it's stupid. That's what I did when I was in takeover, and I thought it was really helpful because I actually did have some kids come up to me and say, what do you mean I'm not specific, and like what does that mean? I'm like, you've got to give details, you explain it them, like so, oh, this is what you wanted. So I had like you know a couple of little writing conferences, and did it make big difference for everyone in the class? I don't know, but I do know it made a difference for two students in particular, so. (group discussion, May 18, 2010)

Sarah framed grading and assessment as including feedback, communication, and respect for students and as related to a particular assignment. She presented a principle of teaching as access to opportunities to learn (Principle 3) and problematized grading as being about both responding to students' work and giving students an opportunity to understand and respond to your assessment. She took up grading and assessment as a problem of practice through her generalizing and specifying in relation to this principle. Sarah engaged in revising talk, which suggests that she understood that there are other potential practices of supporting students reading and learning from teachers' assessments; this is also evidence of problematizing. She used present tense as she explained this instructional practice. Given that each PST's experience as lead teacher during their internship was between four and eight weeks, it is unlikely that Sarah had many long-term projects or "big writing assignments." Therefore, her use of present tense suggests that this practice is one that she understands as important to her future practice. Sarah also responded to my earlier question about the nature of the assignment by describing large writing assignments.

Sarah articulated assessment as this ongoing process and related to issues of equity, consistent with *Principle 1, Responding to students*: When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx). Sarah identified the pressures of test-based accountability and the pressures of using a defined GradeMax grading program that has limited options, but she also presented the specifics of other classroom practices, ones that align with principles of communication, respect, and opportunities to learn that she wants to embrace. In this manner, she identified possibilities for repositioning and subverting the Graverly County way and also specified her practices.

Sarah’s discussion of assessment is not specific to mathematics teaching, but it aligns with how the ElCert Standards (Appendix A) and the National Council of Teachers of Mathematics (NCTM) frame assessment. NCTM defines assessment as a *process* that should support student learning of mathematics and provides useful information to students and teachers:

When assessment is discussed in connection with standards, the focus is sometimes on using tests to certify students’ attainment, but there are other important purposes of assessment. Assessment should be more than merely a test at the end of instruction to see how students perform under certain conditions; rather it should be an integral part of instruction that informs and guides teachers as they make instructional decisions. Assessment should not merely be done *to* students; rather it should also be done *for* students, to guide and enhance their learning (NCTM, 2001, p. 22).

Sarah presented assessment in a manner consistent with NCTM and described how assessment can enhance and support student learning.

It is significant that Sarah addressed the institutional discourses of accountability and the problems that other PSTs identified, but then also described assessment as an ongoing practice in her test-driven context and identified how she and others can position students as learners through assessment. Sarah suggested assessment can be a way to measure students' growth, and she was less concerned with objectivity or test-based accountability in her classroom. Sarah repositioned herself in relation to institutional discourses of assessment, while also maintaining alignment with her principle of providing students access to opportunities to learn (Principle 3) and, specifically, to do well on assessments.

Other PSTs appreciated Sarah's approach and discussed it at length. This was a critical conversation in Session 4 because of the ways in which Sarah's approach supported continued conversation and problematizing of practice. For example, Candice asked a specific question:

Candice: Do you allow the kids to redo the work after?

Josephina: That's what I was going to ask you

Sarah: My mentor is really against that, but during takeover I actually let a couple of kids retake a couple of science tests and a social studies test.

Brooke: Tests or writing?

Sarah: Tests. The writing so much like, when I've done big writing projects, it's been four or five steps so it's, I've known the kids who

weren't going to be successful at it so a couple of them. Like one, I pulled one of them aside and I said you need to put more time into this and of course, they were all successful. I don't think like any, the last time I did a big project, I think like everyone got like an 80 or above. And that was really, you know, they went through the whole process, they went through a draft in using several graphic organizers, they did a draft, and they, um, did peer revisions and they did another draft and that draft was again reviewed by someone. And, you know, I was monitoring them, and my mentor was monitoring them and the ones who were writing things that didn't make sense, you know, they got feedback on it, all through the process, so for their big assignments, those counted as like test grades or assessments, none of them really needed to. (group discussion, May 18, 2010)

Sarah responded in detail to Candice and Brooke, describing her role in working with students and providing access to learning opportunities and success on the assignment. She did not express concern that students received support or similar grades in the end. In this way, Sarah understood her role as providing necessary supports along the way and did not describe herself as restricted by grading or accountability pressures more generally.

***Interrogating the multiple discourses that position teachers and teachers' options for practice (Portfolio presentation).*** In her final portfolio, Sarah specified the relations between her mentor's classroom management, her teaching, and the related

accountability pressures in her institutional contexts, integrating many of the different elements of her positioning that were separate in earlier comments. Sarah began her portfolio with a discussion of her mentor and her feelings of being in her mentor's classroom.

So, just to start off, this is my kids' favorite book. A lot of them, um, read, *Diary of a Whimpy Kid* [Kinney, 2007], throughout the year, and I actually read it, um, because I wanted to know what they were so fascinated with. So, actually, I decided to, um, kind of make the theme of my portfolio, *Diary of a Whimpy Student Teacher*. Um, I spent the last, the school year, in my mentor's classroom, and um, although I liked her, and I, I had a lot of problems with her classroom management style. I felt that she was too much of a disciplinarian. She was too heavy handed with the kids. She relied on humiliation and fear, and although she was an effective teacher because the kids definitely made progress throughout the year, her classroom management style was not comfortable for me, and I just, I kind of struggled with this throughout the year, throughout the internship. I, um, I kind of felt like the main character of this book at some point. Because here, this kid, he's kind of in culture shock, he's starting middle school, and he's in a new environment, and that's kind of how I felt, so I kind of could relate to this, this book that my kids were all so fascinated with. (Portfolio presentation, June 21, 2010)

Sarah also prepared a written narrative to go along with this presentation, which clarified how she felt her mentor positioned her and her students and how her mentor was positioned by test-based accountability:



She is a strong disciplinarian who relies heavily on extrinsic rewards, public humiliation, and fear to manage student behavior. Frankly, I think she bullied our students and me. Yet, students and teachers alike hold her in high regard as her style of classroom management is common at Owl Creek [Elementary School]. And she is an effective teacher because our students made tremendous progress during the school year. On many occasions I felt like Greg Heffley [who is the main character] in *Diary of a Wimpy Kid*. I found myself struggling to make sense of the school culture and to fit in at Owl Creek. (Portfolio presentation, June 21, 2010)

Sarah identified the contextual elements of how she is positioned by her mentor and how her mentor positions her and her students. She also discussed how her mentor is positioned as “effective” because of students’ progress on standardized assessments and because her mentor’s style of interacting with students is common at her placement school. In doing so, she suggested that school culture influenced her mentor and Sarah’s own understandings of her reactions.

Sarah also described the classroom- and school-level influences on her understandings of teaching:

So, August, I was definitely in culture shock. I was definitely adjusting to the routines, the day, and I was also adjusting to the whole test-prep mentality. So, this is a Title 1 school, so we did a lot of workbook work, a lot of skill and drill, and we did a lot of fun stuff too, but it was not really what I kind of expected. I had this vision of what, kind of, an elementary school was, student-centered and meaningful discussions and all this stuff, and I kind of wasn’t seeing that at first,

and I don't know if maybe I just, I had a critical lens and so maybe I was just looking for it. At some point, I just decided I can't focus on the negative and I need to focus on the positive because there were a lot of positive things that were going on. (Portfolio presentation, June 21, 2010)

Sarah had a vision of what an elementary classroom would be like, and she did not see this reflected in her placement. Identifying the way she initially understood her context and relating this to her previous understandings of school suggests the manner in which she was critically examining herself and her context.

In the remainder of her portfolio presentation, Sarah addressed the required elements of the portfolio presentation. This portfolio presentation, as the culminating pieces of her master's certification program, serves multiple goals. Capstone instructors presented the portfolio presentation to PSTs as a space to share their "journey" or "who you are as a teacher," but there were also specific requirements, including evidence of program standards (Appendix A) and the inclusion of "a story/theme/metaphor that is cohesively woven throughout the narrative." These requirements functioned, in effect, as restrictions for PSTs in presenting their *own* story, and many PSTs expressed confusion and frustration with this process. This portfolio is also a major graded assignment and shared in front of peers, faculty, and any teachers that choose to attend. It is significant that Sarah negotiated the requirements of this assignment while also integrating how she struggled in her internship and with her mentor into her final portfolio presentation.

These ideas can be seen as counter-productive in a presentation of a document for the final requirement for a master's certification program because they revealed her struggles and not simply her triumphs. Her presentation was unique among the cohort's

presentations in this manner and suggests that she was actively repositioning of herself as a teacher and negotiating teaching in her context. This portfolio, because of the manner in which she was critically reflective, may have been an important process for Sarah.

At the end of her portfolio, Sarah returned to discuss her mentor teacher and herself as future teacher:

I worked really well with my mentor. Even though my presentation probably started very critical of her, she's an amazing teacher, she's just operating within this Title 1 environment, where there is all this pressure on teachers to maintain pace with the curriculum guides and FAST test. I mean, the kids were tested four times. That was an amazing amount of time. I actually calculated the amount of hours and amount of days. I think that it was something like over a month of school days were disrupted by testing. So, overall, I think that kind of informs my critique of her. I had a really good year, and I look forward to next year.

(Portfolio presentation, June 21, 2010)

Sarah connected her mentor's practices and her positioning by institutional pressures to both her instructional practices and management style. This comment is significant because of how it presents Sarah's repositioning and negotiating her positioning in ways that were not demonstrated in other reflections. Sarah connected her mentor's teaching *and* how she positions students, which is what she identified as her mentor's classroom management style and how it was uncomfortable to her, to the institutional pressures of accountability. Sarah was also reflexive about her mentor's positioning and how she would use this experience to inform her teaching next year. She suggested that she would also be positioned by the institutional pressures of accountability, but she ended her

presentation with expectations of herself and her future teaching. She expressed hope. Although it is not clear that she felt that she would actually enact practices different from those of her mentor, Sarah identified and specified the *possibilities* for repositioning, which suggests *shifting* understandings of self.

**Discussion of Objective D.** Across the episodes in this objective, Sarah analyzed and evaluated teaching decisions in the reality of her school context. She problematized teaching around a principle of providing access to students' opportunities to learn, describing classroom practices that allowed students' ownership over their learning as well as opportunities for feedback. Sarah also analyzed her teaching context, her mentor's teaching practices, and the ways in which she understood how the system of standardized testing positioned her mentor in particular ways. Sarah discussed her mentor's practices and management style as resulting from her context, but she suggested that she had options for including different practices, such as student tasks that include rich mathematics and organized times for students to review her feedback on writing assignments. Across these episodes, she specified practices that aligned with principles of access to opportunities to learn.

### **Discussion/Overview**

Across the seminar, Sarah related issues of access to opportunities to learn mathematics, particularly, in a safe environment, to her understandings of herself in her test-driven context. The importance of access to mathematics and the teacher's responsibility for providing access to opportunities to learn and to succeed emerged as central to Sarah's understanding of herself as a mathematics teacher. Sarah attended to how Mr. Jones may be excluding students from having access to higher-level

mathematics and how his low expectations and the way he suggests sheltering his students will not support their future learning. She established that having high expectations of students' abilities and career opportunities and responding to the gate-keeping power of mathematics are critical elements of being a mathematics teacher.

Sarah also acknowledged the institutional pressures in her context and how the test-based accountability systems created certain pressures on teachers and students, which are related to students' opportunities to learn and to engage in mathematics. She described these institutional dynamics and also ways that she could position her students as learners and doers of mathematics that are not only dependent on standardized test achievement. She asserted, however, that it would be "unfair" not to prepare students for standardized assessments. Because of the centrality of issues of access to opportunities to learn and to succeed, Sarah felt compelled to embrace and emphasize test preparation, even as she introduced instructional practices in her mathematics classroom that emphasize mathematics as a process of sense-making.

Sarah also clearly described how it matters how teachers understand and talk to students because it has implications for the kinds of access they offer students. Sarah found the inclusive language in Teacher B's lesson important for positioning students as capable participants in the mathematics classroom, but also identified the low expectations he had of his students' future career opportunities. Sarah was not comfortable in her mentor's classroom because of how her mentor yelled at students and "humiliated them," but she also recognized that her students were "making progress" (Vision statement, March 29, 2010). Sarah resisted critiquing her mentor but emphasized particular practices of questioning and listening to students that she would like to

embrace. The ways in which Sarah identified positioning as contextual, as relational, and in performance suggests that she was reflexive about her understanding of herself as a mathematics teacher in relation to both providing access to opportunities to learn and to succeed and her positioning by pressures of test-based accountability.

Her understanding of herself as a mathematics teacher shifted as she articulated relations between providing students with access to opportunities both to engage in mathematics and to achieve on standardized assessments and teaching in a manner that is respectful of students and their capabilities. In contrast to her earlier discussion where these responsibilities were non-overlapping or perhaps even conflicting, she repositioned herself as able to address multiple elements of access to opportunities as well as a communication style with which she was comfortable. Sarah also identified how her mentor teacher was positioned by institutional discourses of accountability and how her positioning influenced not just her emphasis on test-taking and skills but also the manner in which she relates with students. In this manner, Sarah related these different understandings of being a mathematics teachers as interconnected and complex.

In particular, Sarah shifted to specify her understandings of mathematics teaching as related to providing students with access to opportunities to succeed in mathematics. For example, Sarah identified the importance of including all students in activities and particular mathematics courses, such as Algebra 1 and of teaching test-taking skills as related to access to opportunities to learn and succeed in mathematics. Her understandings of mathematics teaching shifted when she problematized teaching test-taking skills and placed particular emphasis on conceptual understandings, such as number sense, and on the rigor of the mathematics instruction that students receive. In

this manner, Sarah specified that students need access to opportunities to make sense of the mathematics, Principle 3b, which was unique to Sarah's participation. The following principles emerged in the analysis:

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx).
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.
- *Principle 3b, Responding to students:* Teachers need to provide all students with access to opportunities to learn and make sense of the mathematics.

As related to these principles, Sarah emphasized supporting students on standardized assessments. She also articulated assessment as an ongoing process that was also related to teaching for equity because it included opportunities to communicate respect and give students ownership of their learning as well as access to opportunities to learn. In this manner, Sarah identified the pressures of test-based accountability on teachers and students and also specifics of other classroom practices that align with principles of communication, respect, and opportunities to learn that she wants to embrace. Also, through highlighting a new perspective on her own success in mathematics, she problematized defining mathematics success for her students and detailed additional practices, such as having students explain their thinking, as part of mathematics classroom norms.

Analysis suggests that Sarah developed agency for enacting instructional practices that allow all students opportunities to learn through the ways in which she shifted to

understand herself as a mathematics teacher in the complexity of her contexts and relationships and problematized mathematics teaching around a principles of access to opportunities to learn. By deconstructing issues of access and opportunity and recognizing the positive, and not necessarily conflicting, relations between access to mathematics as sense-making, standardized test achievement, and classroom management styles that are built on respect and communication, Sarah's understandings of her contexts, herself as a mathematics teacher, and teaching shifted. In Butlerian terms, seeing the options for new positionings and the complexity of positioning creates possibilities for subversion (Butler, 1999). The process of deconstruction may develop as a resource for Sarah, supporting her in further critical self-examination and reflection on how social, political, and institutional dynamics relate to understanding herself as a teacher and her teaching.

In the analysis of the next case, Laura's understandings of herself as a mathematics teacher shift in ways that are different from Sarah. Sarah identified positioning as contextualized, as relational and in performance, and she described how she is positioned and her opportunities for repositioning herself. Laura was also reflexive about her positioning and problematized elements of the complexity of mathematics teaching in her context, but the ways in which she articulated shifts in her understanding of herself as a mathematics teacher or repositioned herself were different. In this way, although Laura also engaged in deconstruction, the process of deconstruction did not serve as a resource for Laura in the same manner that it did for Sarah.



## Chapter 7: Laura

Laura is a white female in her mid-twenties. Before beginning this program, she worked with students in after-school settings and taught religion classes on the weekends. Laura grew up and currently lives in Haverford County. In Fall 2009, Laura described positive mathematics learning experiences and herself as a “straight A student”: “Math came to me somewhat naturally in elementary school, and as the material became more difficult in middle and high school, I worked harder to fully understand the material and to earn good grades” (Reflections on mathematics teaching and learning, August 28, 2009).

Laura’s internship was in a third-grade classroom in an elementary school in Eastern County. Her elementary school was not designated as Title 1, but she described the student population as including students from low-income families: “It’s not Title I, but then it’s like, it’s sort of like the bottom of the one above that” (interview, July 16, 2010). She attended all of the seminar sessions and completed the written assignments with more detail than the other participating PSTs. Across the written assignments, Laura was the most diligent of the four participants chosen for case analysis<sup>33</sup>. During her engagement with the ElCert program, Laura was consistently attentive and responsive to the expectations of her internship, graduate coursework, and placement school.

### Analysis of Laura Across Seminar Sessions

This analysis, structured by the four objectives, shows how Laura’s understandings of self as mathematics teacher and mathematics teaching were closely related to the discourses about teaching as defined by the ElCert program standards and

---

<sup>33</sup> Laura completed all assignments except two assignments; she did not complete a written reflection on *The Wire*, and she did not revisit her reflections on mathematics teaching and learning that she wrote in Fall 2009.

the institutional discourses of schooling and her placement specifically. Table 7 is a map of the presentation of the case in order to help the reader follow the episodes that are aligned with each objective. Across the seminar sessions, Laura examined the prevailing social, political, and institutional dynamics in schools, such as the role of context in teachers' understandings of students and how accountability pressures reach across many different actors in a school system. She engaged in problematizing teaching as related to enacting practices consistent with EICert standards, mathematics teaching as discussed in her mathematics methods course, and assessing and evaluating students.

This analysis reveals how Laura was reflexive about the many ways she is positioned as a teacher and how she problematized teaching in a principled manner. The following principles of practice emerged in the analysis of Laura across sessions:

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx).
- *Principle 2, Interpreting and understanding students:* Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning.
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.
- *Principle 4, Interpreting school expectations:* To be successful in school, students have to resourceful and responsible.
- *Principle 5, Responding to students:* Teachers should provide opportunities to students to construct their own knowledge.

*Table 7. Presentation of the case of Laura by objective and analytic sections*

Objective A	Objective B	Objective C	Objective D
Identifying goals and standards for her mathematics teaching (Session 1)	Examining and questioning grouping and labeling students by ability (Discourse prompt)	Repositioning herself in relation to her mentor (Session 2)	Problematizing student responsibility (Session 4)
Examining accountability pressures and how they position teachers (Sessions 1 and 2)	Analyzing teaching equitably in her classroom and the relations to ElCert program and standards (Session 2)	Mapping and describing institutional pressures in context (Session 3 and Interview)	Problematizing grading student work (Session 4)
Examining relations between teaching context and teachers' understandings of students (Session 3)	Analyzing her mentor's practices and school context for practices from ElCert coursework (Session 2)	Defining listening to students as repositioning (Session 4)	Articulating a teaching philosophy (Portfolio presentation)
	Examining and problematizing discourses of mathematics teaching about vocabulary (Session 3)	Describing her relationship to test-drive school cultures (Interview)	
	Describing students' goals (Session 3)		

- *Principle 6, Interpreting school expectations:* Teachers must grade accurately.

The following case presents how the principles emerge and how Laura problematizes practice in relation to these principles, albeit in different ways. Analysis revealed that some principles emerged together, such as Principles 2 and 5, and some were in tension, for example, Principles 2 and 4. The analysis details these principles and the practices Laura relates to each one.

During the seminar, Laura emphasized that she wanted to teach particular practices and suggested that her context, not her own agency or capacity for teaching, would determine if and how she would be able to enact these practices. Her understandings of herself as a mathematics teacher shifted in local ways, but she did not suggest that she was agentic in being the teacher that she wanted to be in all contexts. In this manner, the analysis raises questions about the ways in which being reflexive about positioning or problematizing of teaching supported her agency.

**Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations.** In this section, I focus on how Laura identified and examined the implicit discourses defining mathematics teacher and in teaching situations in her written vision statement and in group discussions during Sessions 1, 2, and 3. Specifically, Laura identified her goals for her mathematics teaching and examined how her teaching context would influence whether she could teach in line with these goals. Across these episodes, Laura demonstrated this objective through the manner in which she was reflexive about her positioning, particularly her attention to positioning as contextual, as relational, and in performance.

***Identifying goals and standards for her mathematics teaching (Session 1).***

During Session 1, PSTs discussed the *Algebra for All* vignette and the social and political discourses that they identified as framing the vignette and teachers' actions in particular. To transition to discussing their understandings of themselves as mathematics teachers, I asked PSTs, "What is your vision of yourself teaching mathematics in five years?" (group discussion, March 23, 2010) PSTs wrote in response to this prompt for ten minutes.

Laura wrote a bulleted list titled, *Vision of myself teaching in five years*, during the session. She identified sixteen ideas, listing each as a unique practice. Each statement was in simple future tense, and in every statement (except one), she was the unnamed subject. Laura listed both specific teaching actions, such as, “will integrate content areas,” and “will incorporate balanced instructional methods,” and also more general goals for herself, her classroom, and her instructional practices. These statements included: “will still try new ideas,” “will have established classroom environment where students will enjoy school, learning, and our community,” and “will see each student as individual with unique interests, families, cultures, traditions, etc.,” and “will actively listen to students” (Vision statement, March 23, 2010). One additional statement described student actions: “Students will construct knowledge → I will not *tell* them.”

While Laura created this list to represent her vision of herself teaching mathematics, this list echoes the ElCert program standards (Appendix A). Table 8 presents Laura’s sixteen ideas matched with eleven of the seventeen ElCert Standards. This presentation highlights how Laura included the language, in some cases, the exact language, of the ElCert standards in her Vision statement that she wrote during the session. She also detailed assessment as a process of understanding students’ strengths and weaknesses, which is also consistent with the ElCert standards. The relations between Laura’s vision and the ElCert standards are consistent with research that suggests PSTs take up particular language and ways of talking about teaching and learning from their mathematics methods courses (e.g., Ensor, 2001).

Ensor (2001) found that PSTs took up the language of their mathematics methods teacher preparation coursework but recontextualized and revised these tenets in their first

Table 8. Laura's vision statement and related ElCert program standards

Laura's Vision Statement	ElCert Program Standards
Will still try new ideas; Will draw up on previous experiences, lessons, and resources; Will have a <u>positive</u> attitude ( <i>can do</i> )	Professional Disposition: The teacher candidate exhibits the fundamental disposition of being a learner, demonstrating the commitment to learning and curiosity about his/her students and student thinking and cultivating a learning community that respects diversity.
Will have established classroom environment where students will enjoy school, learning, and our community	Classroom Management: The teacher candidate cultivates and facilitates learning environments that encourage students' social interaction, active engagement in learning, and motivation.
Will be active member of school community	Collaborates with colleagues: The teacher candidate participates in collaborative activities designed to make the school a productive learning environment for students, parents, staff, and administrators. The teacher candidate collaborates with special services staff (e.g. ESOL teachers, special education teachers, counselors, curriculum specialists, instructional aides) to maintain a productive learning environment Engages with community: The teacher candidate demonstrates a commitment to understanding the community that the school serves.
Will see each student as individual with unique interests, families, cultures, traditions, etc.	Culturally Diverse Resources: The teacher candidate integrates culturally diverse perspectives and resources, including those from the learners, their families and communities, into the curriculum.
Will integrate content areas	Integrates Content Areas: The teacher candidate creates interdisciplinary learning experiences that allow students to integrate knowledge, experiences, skills, and methods of inquiry across subject areas.
Will plan thematic units that are engaging and high-interest	Effectively sequences lessons and units: In considering a given curricular framework, the teacher candidate effectively maps out a single unit and develops sequential, daily lesson plans.
Will incorporate balanced instructional methods; Students will construct knowledge → I will not <i>tell</i> them	Uses Specific Disciplinary Principles to Provide Effective Instruction: The teacher candidate plans for and provides learning experiences that are based on principles of effective instruction and pedagogical content knowledge that meets the expectations (structures and priorities) of the various disciplinary areas.
Will differentiate to meet students' needs; Will allow for varied students	Addresses Individual Differences: The teacher candidate assesses individual differences through a variety of formal and informal techniques, then designs and implements

learning styles/intelligences; Will actively <u>listen</u> to students	differentiated instruction appropriate to students' stages of development, cultural backgrounds, strengths, and needs.
Will teach based on assessment (not for a test but based on assessing students' strengths and weaknesses)	Assesses Student Learning: The teacher candidate accesses the appropriate technology and uses a variety of formal and informal assessment techniques for formative and summative assessments of students' learning, analyzes the data, to make instructional decisions and modifications of teaching strategies.
Will use hands on and interactive learning; Will incorporate movement in learning	Effectively Uses Concrete Materials and Resources: The teacher candidate uses a variety of concrete materials, resources, and tools in teaching, such as models, manipulatives, demonstrations, and artifacts, in order to enhance student learning.

year classrooms. For example, the teacher educator that Ensor observed emphasized teaching geometry through “visualization and building on learners' intuitive understandings” (p. 301) and modeled tasks that exemplified this, for example, allowing education students time to explore and represent quadrilaterals in various ways and discuss similarities and differences between representations with others. Ensor found that, for example, Mary, a novice teacher who was an education student in the class, discussed “visualization” both at the end of the courses and in reference to her own teaching practice; however, Mary had recontextualized “visualization” when Ensor observed her teaching in her first year. Her practices were not related to what the teacher educator had described; rather, in Mary’s classroom,

“Visualization” referred to students' looking at the overhead projector where summary graphs and triangles were drawn so that they could follow her explanation and check their work. “Visualization” was thus incorporated a part of Mary’s monitorial approach to teaching. (p. 310)

The findings from Ensor suggest that there is likely to be a mismatch between novice teachers’ practices and what teacher education promotes. Seeking clarification, I

followed up with Laura after she submitted her vision statement and specifically asked her to operationalize certain statements. For example, I asked, “What would it look like to ‘see each student as an individual with unique interests, families, cultures, traditions’? Or having an ‘established classroom environment where students will enjoy school, learning, and our community’? What am I going to see exactly in your classroom?”<sup>34</sup> (personal communication, March 30, 2010). Laura did not respond to this prompt, and her goals remained unspecified.

The intent of Table 8 is to present how Laura embraced her teacher education coursework, its goals, and standards, not to suggest that her statements are not personally meaningful. Indeed, later in the seminar, Laura articulated how the particular language of the goals and standards was meaningful to her. During the Capstone course, the instructors asked PSTs to revisit the essay that they wrote in Winter 2008 when they applied to the ElCert program, about 16 months earlier. During Session 4, I asked PSTs about the experience of looking back on their original essay. Laura described her essay and how she understood it now:

Laura: I think mine was interesting because, like I saw things that, like I didn't have the right—You know, now I have, like fancy words to use. But in describing some of my experiences, like tutoring this one kid—and a lot of connections to what I've learned this year and kind of my beliefs now just, I didn't know it, you know. So that was kind of cool to see, like just.

---

<sup>34</sup> My full prompt was:

I enjoyed reading your vision, and I liked how you had many ideas. Thank you for sharing it. Building on your vision, now pretend that you are teaching and it's a typical day in mid-October. Pretend that I'm coming to visit your class. What would it look like to “see each student as an individual with unique interests, families, cultures, traditions”? Or having an “established classroom environment where students will enjoy school, learning, and our community”? What am I going to see exactly in your classroom? (personal communication, March 30, 2010)



With this one kid like something, I just kind of came to and um, I was tutoring him, I was kind of told like, he was hopeless and he'd been pulled out of the regular- it was religious school, so it's like, not the same thing, but still he was out of his regular classroom because they didn't think that he could learn and he just like goofed off all the time and whatever. And I kind of, not knowing anything when I was working with him, just came to the point, where I just like started to getting to know him because I was sick of like trying to get, force him to pay attention and then over time as we built this really great relationship he started becoming more open to learning. And, um, when I read that, I was like, wow that's really great because that just really does connect like so much what I think what we've learned all this year so it's kind of cool to like.

Jill: We have different ways of like

Laura: Right, right

Jill: to talk about that in ways now

Laura: Right, just that I kind of like came, like I kind of like self-discovered that from that experience. It was pretty cool. (group discussion, May 18, 2010)

Laura identified that she now had the “fancy words to use” when talking about teaching and how pleased she was that her emerging ideas about teaching were consistent with the language of her teacher education coursework. In this manner, the goals and standards of ElCert and the ones that she listed in her vision statement are personally meaningful to her and she embraced them as her own. She recognized that she was using the language

of her coursework and identified that it was meaningful to her, thereby positioning herself as an ElCert student and identifying how she was positioned by the program.

*Examining accountability pressures and how they position teachers (Sessions 1 and 2).* After PSTs wrote their vision statements in Session 1, Candice described the pressures of test-based accountability and how they positioned her as teacher. She felt a responsibility and pressure to ensure that her students met particular benchmarks and understood that her reputation as a teacher was related and dependent on her students' achievement on the high-stakes achievement tests. She also identified the implications of these pressures as created a tension about where she would teach, calling teaching at a school where students are not high achieving as a “sacrifice” because the ways in which teachers' job security and personal reputation are at risk because the students may not succeed on the standardized assessments.

In response to Candice, Laura described a similar tension. She emphasized how her teaching context would limit the type of instructional practices she could enact:

I imagine myself as a certain, teaching a certain way but recognizing that in certain places I can't do that. I can't have those freedoms. But then I recognize that I am really limiting myself to places, where I can, you know, if I, if it's a priority to me to teach in a way that I want to, I'm really limited to places that are going to give you that freedom. (group discussion, March 23, 2010)

Laura shared how she felt that in certain schools she would have less freedom in how she could teach, specifying how school context matters for how she is positioned and how she is able to position herself or engage in certain practices. This comment followed PSTs' writing of their vision statements, and it is likely that the way she imagined herself

is consistent with her vision statement, and thus, the ElCert program standards. In this comment, Laura also emphasized the importance of these particular practices to her.

Following Laura's comment, Brooke responded to the tensions that Candice and Laura raised and suggested that these same accountability pressures, or the standardized assessments in particular, did not influence her in the same ways that Michelle, Candice, and Laura mentioned:

Brooke: But see, I don't feel like that. I don't feel like that influences me all that much because like I'm spending 5 days on this stupid volume lesson, which really doesn't have the huge practicality of counting these imperfect like block shapes, but I'm doing it because it is going to be on their unit assessment. But the majority of the stuff I teach is all beyond what is being assessed on those tests. So I feel like the test doesn't necessarily, like I make sure that I hit those things but it is only like, you know, a couple of things that I need to do and I have a lot more time that I get to do a lot more enriching things with my kids.

Jill: Now, how is that, how is that in your situation because there is this prevailing way of thinking that your kids are above grade level right? ... What are they? In second grade doing third math?

Brooke: Right

Jill: How does that allow you then to not have these same struggles?

Brooke: Well, because—

Laura: I'm teaching the same curriculum but to the lowest, [laugh] I hate to say it third graders, and so we probably see it, very, this exact same curriculum in very different ways. (group discussion, March 23, 2010)

Both Laura and Brooke administered the third grade mathematics assessments to their students, but Laura identified that because she taught the lower-ability third graders, she saw the curriculum differently. In this manner, she recognized that how her students were positioned in mathematics influenced her practices, her options for her practice, and her conception of the material that she taught.

Laura highlighted her teaching context in Session 2 in a similar manner, discussing compromises she would make if she were to teach in different school environments.

I think that, maybe we brought this up last time or maybe a little bit today, you have to make compromises because like, when we were walking around the school and then we came back like and everybody was kind of like, "Wow, look at how nice it is," and "They have these freedoms." They have this amazing arts program here, and like so many freedoms in what they teach, so much creativity I guess I'd say, but you know it's also a very privileged population here, and so we have to make decisions where maybe you'd want to work with a different population or where the school is much more regimented in what you do and so we have to make compromises. (group discussion, April 27, 2010)

Laura's comments are consistent with her earlier description of the choice that she felt that she had to make. We held Session 2 in a newly-renovated arts-based school in

Haverford County, and the PSTs took a tour of the school before they met for their course that met before our session. Laura recognized how aesthetically pleasing the school is as well as how the teachers did not respond to the pressures of test-based accountability through the instructional practices that are prevalent in test-driven schools. She suggested that the teachers have freedoms and can be creative, but she also linked teacher practices to the school setting and the student population. In this way, Laura recognized that certain populations of students do not have opportunities for arts-based schools, and students from less privileged backgrounds are subjected to regimented school cultures and test-driven instructional practices.

Laura set up a contrast between (a) schools where teachers have more flexibility and “freedom” about what they teach and schools that serve students of privilege and (b) schools that are test-driven, serve a less privileged population, and are also inferred to be racially and socioeconomically diverse. Laura contended that she needed to choose one or the other and did not interrogate how teachers may be able to work within the constraints of how they are positioned and how students are positioned in either setting to provide opportunities for both teachers and students. She described how the decisions about where she would like to teach are related to both her teaching practices and the student population. She was conflicted, however, about teaching in the more regimented school context where she would have a particular school population that she would like to serve or in the school context where she would have more freedoms.

***Examining relations between teaching context and teachers’ understandings of students (Session 3).*** In Session 3, we read the case of Teachers A and B (Appendix E).

In our discussions of the teachers' interviews, Laura suggested that context influences how teachers are positioned and how they position their students:

Candice: What is elite? Like he said that they're going to be check-out girls.

Melanie: Yeah he obviously doesn't think much of women

Jill: So, what's the

Laura: It's like, something I was going to say before you said that is that we would probably also judge them differently once we knew the demographic. Like that would also influence, you know, how, if we thought their expectations were okay. (group discussion, May 11, 2010)

Laura identified how teaching context influences teachers' positioning and, in response, how they position their students. When she said that the student demographics would "influence... if we thought their expectations were okay," she recognized that there are differing perspectives about different groups of students, such as "interpretations of underachievement and limited persistence" of African-American students (Martin, 2007, p. 149) and prevailing deficient perspectives of students in urban schools or underserved schools, particularly by white teachers (e.g., Sleeter, 2008b). She explained that Teacher B could be responding to these discourses of underachievement and how his response is consistent with both current social discourses about students and the research in teacher education that suggests how teachers understand their students in relation to these discourses (e.g., Sleeter, 2008b). Laura's response is significant because she identified the contextual and relational elements of how Teacher B is positioned and how his positioning in relation to these discourses surfaces in how he would position his students

(positioning in performance). Laura demonstrated how she was reflexive about how school contexts influence teachers and the expectations they set for their students.

***Summary of Objective A.*** In the episodes related to this objective, Laura identified her mathematics teaching goals and examined the ways in which the institutional contexts of teaching positioned teachers and influenced their practices and their understanding of students. The analysis suggests that Laura's understandings of herself as a mathematics teacher is strongly reflective of the ElCert standards. She emphasized institutional contexts as related to how she understood herself enacting particular practice, and she was reflexive about her positioning as contextual, as relational, and in performance. The concerns she raised are consistent with the challenges and constraints voiced in educational research and teachers' accounts of practice in test-driven school contexts (e.g., Valli et al, 2008; Wanatabe, 2008). Studies such as these would suggest that she would have challenges in teaching with "thematic units that are engaging and high interest" and using assessment as a part of instruction, as Laura suggested in her Vision statement (March 23, 2010).

**Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers.** In this section, I describe and analyze how Laura investigated the implications of prevailing social discourses on schooling, teachers, and students in her written statement after Session 1 and during Sessions 2 and 3. Laura examined teaching practices in schools as in contrast to practices outlined in her teacher education coursework, and she emphasized how this has implications for students and her own growth and learning as a PST. Laura detailed and problematized grouping students by

ability, supporting students' individual differences, and teaching mathematics vocabulary terms; she was less clear when problematizing how teachers should set goals with students.

***Examining and questioning grouping and labeling students by ability***

***(Discourse prompt)***. During Session 1, we created a working definition of discourses as “forces outside the individual, structures of statements, that influence the individual, shape understandings and actions. Like, there are prevailing forces that are kind of framing teachers’ reactions.”<sup>35</sup> After Session 1, I asked PSTs to respond a prompt about how these discourses or others influence their teaching, themselves as a teacher, or their students (Session 1 lesson plan and prompt are in Appendix B).

Laura responded to this prompt with a detailed 890-word written response about labeling and grouping students. She identified that teacher education emphasized a particular view of grouping students by ability that was not present in her school:

In our education classes, I feel that there has been an emphasis on heterogeneous grouping while I have found that the schools mostly defer to homogeneous grouping and labeling students to do so. All the time, we refer to students as “above”, “on”, or “below”. In many ways, attaching these labels makes life easier, but it also attaches stigmas about the student’s ability and desire to learn. For example, my math class is considered heterogeneous because it has students who are both on and below grade level in it. However, it is also considered the low math class because all of the students who receive special education services are in the class. The students work in separate classrooms and with different

---

<sup>35</sup> See the case of Sarah, p. 282 for detailed information about the creation of this working definition.



teachers to learn the third grade objectives and to practice problem solving. These areas are not integrated. (Discourse prompt, May 2, 2010)

Laura described that labeling students by ability allowed teachers to group students and make generalizations, which is efficient when designing and implementing instruction. She also recognized the implications of this for teachers and students, particularly how these labels stigmatize students, and how teachers and students thereby understand these students as having lower mathematics ability and lacking the desire to learn. Throughout this written reflection, Laura used quotation marks around the labels of students, such as “‘on’ grade level,” suggesting that she found the labeling troubling and did not want to imply that she believed in these labels.

Laura also illustrated how the manner in which her school enacted policies of grouping students by ability resulted in students’ differing opportunities to learn. She suggested that the students in the group determined to have the lowest ability did not receive challenging problems and did not have the same opportunities to engage in problem solving. A dominant discourse about grouping students by ability or tracking prevalent in many schools, such as Laura’s, suggests that “students must master the basic skills before they could tackle a ‘higher order’ curriculum [which is] emphasized by regular-class lessons thought [to] boost test scores on those basics” (Oakes, 2008, pp. 706-707). Consistent with this discourse, Laura described how teachers in her school have low expectations for the students in the lower group and therefore classroom instruction focused on skills and not problem solving.

Laura specified how grouping students by ability related to how teachers position students and also how they act on their positioning of students. She described how she

wanted to challenge her students, but her colleagues told her, “The numbers in the problems were too difficult and had to be changed” (Discourse prompt, May 2, 2010). She continued and articulated the implications to students in both the “below-grade-level” and “on-grade-level” group:

I recognize that for some of my students, they would really struggle using fractions with different denominators; however, I also know that many of my students could handle the challenge. Since they are not challenged to solve more difficult problems (that are still considered 3<sup>rd</sup> grade level), they do not have the opportunity to make as much progress as students in other classes who are challenged. I worry what will happen next year when they are placed in a new math class with other “on” students. They will be behind because they have not been taught problem solving skills. Some of these “on” students are not strong math students, and I also worry that continuing to call them “on” is harmful to them because they are not receiving extra attention and support, which I feel they need. One day they will not be able to get by and will fall behind. As a teacher, I plan to have high expectations for all my students and to recognize their progress rather than their shortfalls. (Discourse prompt, May 2, 2010)

Laura detailed and traced how a view of students as incapable and “below-grade-level” translates into limited access to opportunities to learn problem solving and other mathematics this year and in following years, thus leaving these students further behind. She described how the implications of labeling “on-grade-level” students also positions students as capable, even if they have not had the same mathematical opportunities as

other students labeled “on-grade-level.” In this manner, she described the implications for classroom teaching and students’ future positioning as mathematics learners.

Analysis suggests that Laura problematized grouping students by ability, specifying the teaching practices that do and do not provide opportunities to learn and the implications for students and teaching. She included actionable steps, such as providing challenging problems, and my analysis suggests that she aligned her practices with a principle of having high expectations, specifically the principle that I identified as *Principle 3, Responding to students*: Teachers need to provide all students with access to opportunities to learn. As a teacher, she described how she planned “to have high expectations for all my students and to recognize their progress rather than their shortfalls” (Discourse prompt, May 2, 2010). Laura’s statement is consistent with the ElCert standards. She also detailed how she would have high expectations for her students, for example, describing giving more challenging problems to all of her students.

Laura also identified a principle of interpretation, *Principle 2, Interpreting and understanding students*: Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning. She discussed how students are labeled and positioned by this label on the basis of limited information, presumably a test score: “Every student learns at his or her own rate and has a unique combination of learning styles and multiple intelligences. Some students are good at school and can succeed within the structure of schools.” Laura described how students have understandings and strengths that are not taken into account when they are labeled as “below-grade-level,” and she generalized to a principle about interpreting and

understanding students as individuals with resources that may not be related to school assessments, or more generally, Principle 2.

Laura was conflicted about whether heterogeneous or homogenous grouping was more beneficial for student learning or more effective for her teaching:

While I believe that heterogeneous groups have many advantages for students, I also often wonder if it does a disservice at times to the “lower” students... Often in groups, [“on grade level” students] will be the dominant students volunteering to participate, carrying on the conversation, and answering questions. As teachers, we often rely on informal assessment of our class’ understanding of the material to determine our next steps for teaching. So when we hear the more vocal students mastering the content, we might do a formal assessment before continuing to the next topic. However, when we assess each individual student, there might be those who earn high grades and those who do not. Rarely do we stop to reteach that information to the students who have not mastered it yet. Instead we move on and those students earn average to below average grades. These grades end up defining students and contributing to their labels. For these students, assessment is not used as it should. Instead of using assessment as an indicator to teachers that some students need more time and different instruction to master those skills, we enter the grades and move to the next objective. Over time, this can create a disadvantage for students who do not learn material as fast as others or in the same way as the majority of students in the class. ... In this sense, I feel that students might be better served if were to group them homogeneously so that we could differentiate our teaching to each group of

students' strengths and weaknesses and ensure that every student learn to his or her potential. (Discourse prompt, May 2, 2010)

Laura described in detail how teachers position students based on their participation and their previous achievement and then make decisions on their instruction based on the whole group, decisions which may not be beneficial for the individual student. She illustrated many ways in which she was attending to the intricacies of grouping students by ability and what these labels meant for her students and her classroom. She articulated that grouping students by ability may operationalize providing access to opportunities to learn to all students (Principle 3), and she also emphasized the ways in which she felt that accountability pressures then make grouping students by ability a potential strategy for supporting student achievement.

Laura also articulated how there is another “argument” about grouping: “On the other hand, there is the argument that students learn best from each other and that student modeling helps all students’ succeed” (Discourse prompt, May 2, 2010). Laura identified how students can learn from each other and how opportunities to work with other students can support students in learning about collaboration. In this manner, Laura articulated that she felt that there are multiple ways to enact Principle 3 or provide students with access to opportunities to learn mathematics. Laura suggested including both in her instruction:

Ultimately, it comes down to a balance and using a mixture of grouping methods in the classroom to help all students achieve. As for labeling, it is important not to get too stuck on the labels we are forced to place on students, to see each

student as an individual with strengths and weaknesses, and to work hard to try to help every student learn and be successful. (Discourse prompt, May 2, 2010)

Laura described the labels as “labels we are forced to place on students,” and listed strategies that she felt would allow her to not rely on the labels and allow her to address the tension between grouping students by ability and the way her teacher education coursework does not support homogeneous grouping: do not get “stuck on labels,” “see each student as an individual,” and “work hard to try to help every student learn and be successful.” In this manner, Laura emphasized *Principle 1, Responding to students*: When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx). She described how she could contest these labels *inside* her classroom through her instructional responses, thereby situating a principle of interpreting students, Principle 2, and a principle of teaching response, Principle 3 about access.

Laura was reflexive about how she understood the contextual, relational, and in performance elements of how these discourses position teachers, and she problematized mathematics teaching in relation to these issues. Her detailed response suggests the many ways in which she understood how students and teachers are positioned by issues of grouping and labeling students by ability as contextual, as relational, and in performance. Her response was also consistent with her vision statement, as she described particular strategies highlighted in teacher education, such as “see[ing] each student as an individual” and “differentiat[ing] our teaching to each group of students’ strengths and weaknesses” (Discourse prompt, May 2, 2010)

*Analyzing teaching equitably in her classroom and the relations to ElCert program and standards (Session 2).* In Session 2, I posted the list of messages and discourses about mathematics teaching that PSTs generated in Session 1, and I noted, “An explicit mention to diversity is noticeably missing.... You've had two diversity courses. Like, was there a take home message about diversity?” Laura responded:

Laura: Um, I just think like, I think just getting to know every student and teaching to every student's strengths. Um, so teaching different communities, and there are communities, like funds, like different communities have, um, are. You have to take like know your community, the students' communities, families. Take all of these things into effect. Um.

Jill: All right. Know your students. Know your communities

Laura: That's, I don't know, to me was a big take away. Which, I think I don't think was necessary in two semesters, in two different classes, like I think it could have been done in one, but I do think it's good because I feel like at school, when you start working with teachers, we're there all the time, and I get a little jaded sometimes. And

Jill: Right, so what's the message at schools?

Laura: So, I think that it is an important message because I definitely see in my mentor sometimes, you know, like this hesitation to accommodate. And we've had two situations actually recently, in the past couple weeks, one with parents, who like want their kid to qualify for special education because they want more support for him and they don't think that he's

going to qualify and then the other with a girl who is GT [Gifted and Talented], and she's like bored and wants individualized attention so you can have somebody like teaching her everything at her level. And I definitely think that we need to accommodate them. I wouldn't say that my teacher doesn't think we should but still there's this sort of, a little bit of that has to do with this is a public school and we're here to teach 26 kids at what time. And there's a little bit, like, hesitation. And I under—it's hard when you're teaching with that many kids. Um. But I do think that it is helpful to have that message in the back of my mind to keep reminding myself, you know, what really looking at the students, what we can do for them. You know, it's very easy to forget about that. (group discussion, April 27, 2010)

Laura explained the message from her diversity coursework as about knowing students and their communities and using knowledge about students' culture and families to understand their learning. She emphasized that this message was important to her, a principle, consistent with Principle 2, which is an interpretive principle that all students are unique in their academic and cultural backgrounds. Laura detailed the ways in which students are unique and have different resources, thereby specifying practices around Principle 2. She felt that her mentor's "hesitation to accommodate" did not align with or operationalize this principle and thus this principle from her diversity coursework was not present in her mentor's classroom. She understood that individualized instruction would be difficult with twenty-six students in a classroom, but she did not problematize why her mentor was not teaching in a manner consistent with Principle 2.



Laura maintained that she will “keep reminding herself” of the importance of “getting to know every student and teaching to every student’s strengths,” thereby adhering to her vision statement and personal goals. I identified this as a principle of teaching response consistent with Principle 1 of responding to students as competent and capable. Laura suggested that getting to know students and making accommodations were practices that were aligned with both principles, but she was less clear about what it meant to operationalize Principle 2 or to enact Principle 3. That is, Laura did not specify Principle 3, but she felt that specifying principles of teaching response had been difficult because she had not had opportunities to see her mentor engaging in related practices.

*Analyzing her mentor’s practices and school context for practices from ElCert coursework (Session 2).* In Session 2, Laura discussed how other teaching practices emphasized in ElCert are also not practiced in schools or present in her classroom. She highlighted the role of mentor teachers in shaping PSTs’ understandings of students and teaching and how she struggled with continuing to position herself in line with the practices of teacher education from her coursework as a teacher in her mentor’s classroom:

Laura: One thing that's hard, and I'm not really sure that there is an easy fix for this, is that we learn one thing in our courses and often that is not what we see in our classes. And that is incredibly frustrating to me so um.

Jill: So give me an example

Laura: So, I mean okay, so for example, like we’re taught to like teach writing—like, some of the methods, okay, so like in math, it'd be like math through problem solving. Or in writing, um, my teacher does not use Writing

Workshop, and we're taught that this is the best way to teach writing. Maybe I've come to appreciate what I think Writing Workshop would be like even more because I don't see it. And maybe if I did see it, I wouldn't. But yeah, it's like at this point in the year, I've come to think, like this is what writing in our classroom is missing, and oh my gosh it's all adding up to Writing Workshop. So in some ways I'm kind of coming to that on my own terms, that yes I do think that some form of something like Writing Workshop, but then I'm like, I have no idea how to do that next year *because* I haven't seen it. So think that's great, and that's part of a teacher education program, for us to be learning the newest teaching methods and those kinds of things to take with you into the classroom, but it's really hard when we don't see that in our internship, because that is what is ultimately really teaching us how to teach. I know that I've heard people in my school say, like there was this sub who was an intern a couple of years ago and she got a job in first grade, apparently she and her mentor are the exact same teacher. (group discussion, April 27, 2010)

Laura identified how mentor teachers may limit PSTs' exposure to particular instructional practices, such as problem solving and Writing Workshop, and thereby shape PSTs' interactions with teaching. Laura described how she now believed Writing Workshop would work because of what she has seen in her classroom, potentially a lack of student progress or engagement in reading and writing activities, but she was unsure of how to implement a program that she has never seen and was also unsure if she would agree with the program if she were to see it. Even as her teacher education coursework

described other instructional practices and principles, particularly ones she understood as important, Laura indicated how the internship shaped her teaching (and the teaching of another intern in her school). This analysis suggests how Laura wanted to uphold the principles of practice as presented in her coursework, such as Principle 2 of understanding students and Principle 3 of providing access, but did not feel agentic in implementing these practices or principles in her classroom because she had not seen them. Laura explained that her mentor did not engage in these practices; however, she did not identify the ways in which her mentor is positioned nor problematize *how* to implement these practices in her classroom.

As others discussed the former PST who is “the exact same teacher” as her mentor, Laura described how she was not judging this teacher’s practice but using her as “example of how much, what our mentor does, especially when you only have one mentor the entire year, that influences you” (group discussion, April 27, 2010). Laura described how she “experimented,” trying to enact practices in her classroom consistent with her teacher education coursework in order to better understand how to teach. She found this challenging. This experimenting suggests how she worked to reposition herself in relation to her mentor’s practices.

Laura also identified how the ways in which mentors position PSTs has implications for student learning and school change:

It speaks like to the bigger picture of education moving forward because my mentor was actually in this program ten years ago but she is not teaching math with problem solving and some of these things, I promise you. So I don't know what she learned. And actually they only had one, one or two reading classes

back then, so, she's you know, so she's gone through this program, but ten years later, I'm sure what I'm learning has changed over, at least some what. So this is about the bigger picture, if we want education to move forward, then we really want new teachers to be coming in and doing new things. (group discussion, April 27, 2010)

Laura situated her concern with this former PST and her mentor as related to “moving the field forward.” She thus implied that teachers can move the field forward through embracing and enacting practices of teacher education. In this manner, Laura expressed her strong alliance with principles and practices of ElCert, positioning herself as an advocate for these principles and for what she had learned in ElCert.

***Examining and problematizing discourses of mathematics teaching about vocabulary (Session 3).*** We read the lesson transcripts of Teachers A and B during Session 3. Teacher B, in contrast to Teacher A, did not include definitions of the vocabulary terms but emphasized how graphs show “relations” or a “getting together” (see Appendix E for the lesson transcripts of Teachers A and B and the full activity). In response to the discussion prompts about the formal language of mathematics and about how authority is distributed across the teacher, student, and content in each lesson, Laura compared Teacher B’s teaching to her own teaching. She described how Teacher B’s introduction to domain and range and the manner in which he presented the terms was consistent with how she taught students about polygons and quadrilaterals:

What I think about is, like, well, I think it was with square and rectangle. Because we also did a polygon and then, they're always like, you know, “A square is smaller.” I'm like, “Really?” You know, and I go draw it. So, it's like your job to

um, give the counter examples. And like well, I drew a big rectangle, er a big square with a little rectangle inside and I'm like, "Are those still a square and rectangle?" You know, "Oh, well what else do you, you know?" And just keeping pushing them. And like right that's our job to kind of guide them to find, to discover it on their own because they can. (group discussion, May 11, 2010)

Laura described the teacher's role in teaching mathematics, and vocabulary in particular, as facilitating students in determining terms and categorizations, and she detailed how teaching students particular mathematical terms should be done through teacher-directed student inquiry.

After reading the interviews of Teacher A and Teacher B, Laura responded that she thought that the interviews would be "opposite," that is, the interview with Teacher A would match the teaching of Teacher B and the interview with Teacher B would match the teaching of Teacher A. She described how she came to this understanding and both her assumptions and how the teachers were positioning their students:

Because the way that they were teaching, kind of seems to be. It conflicts. The way they were teaching conflicts with what we would think their expectations are. So, Teacher A has higher expectations, um, that everybody *can* be in business and science, you know, can. So has high expectations, but then it's just funny because then when we looked at the way Teacher A was teaching, we thought, "Oh, they're just like feeding them and it's boring and they're not going to learn anything from the way that they're teaching." Um, so, and we thought, we thought that, our assumption was that Teacher B was like you know helping them construct their own knowledge about math and then we look at, you know, and

they have fairly low expectations. In some ways, I think there's a realistic perspective that we want all kids to be able to do math even if they think that they're not going to need it in the future but at the same time, when you, then when you see teacher A, and see this person, you know Teacher A thinks that all the kids of your kids have the potential and *can*, you know, *be* mathematicians, you know. *That* is a higher expectation. (group discussion, May 11, 2010)

Laura associated Teacher A's discussion of his students as mathematicians with his high expectations, but she did not see his instructional practices as supportive of student learning. Consistent with her comment about her own teaching and her vision statement, Laura valued a particular way of teaching, where the teacher is not "feeding" students the information. She used the phrase "construct their own knowledge" to describe Teacher B's less structured, less direct manner of teaching, and this comment is consistent with and details statement from her vision statement: "Students will construct knowledge. I will not tell them" (Vision statement, March 23, 2010). To Laura, this means the teacher questions the students, but the student "discovers" or specifically defines the term on his or her own. Laura identified with her mathematics methods course, which emphasized the ways in which teaching can support a constructivist learning theory. As this principle emerged as salient to Laura across sessions, I identified this principle as *Principle 5, Responding to students*: Teachers should provide opportunities to students to construct their own knowledge.

In her comment, Laura identified that there are practices of mathematics teaching that she saw as reflective of higher expectations (Principle 3) and that her view is aligned with a view of mathematics teaching that she felt was reflected in her mathematics

methods course. In our conversation, she described how a lesson that had some sort of exploration would be consistent with having high expectations of students, and in this manner she detailed Principle 3 in a mathematics teaching context:

Like when [Teacher A] says, “It's important to say one and only.” Well, did they have some conversation? Like was there some exploration where like that was something that came up and you, so that's why he's emphasizing that, you know that one and only one? You know, right, we don't have before— (group discussion, May 11, 2010)

This is consistent with both how she described teaching polygons and quadrilaterals and her vision statement. She then hypothesized how Teacher A's practice could be consistent with her view of vocabulary and the way mathematics teacher education encourages the exploration of vocabulary. Since Teacher A's interview suggested that he has high expectations of his students, Laura described how he may have already engaged students in practices that were consistent with her expectations. In this way, Laura was making sense of the discrepancy between what she understood high expectations to look like when teaching mathematics and the presented excerpt from Teacher A's lesson.

Laura felt that a lesson reflective of teacher's high expectations would include students' active involvement in their learning through explorations. She was not specific, however, about the relationship between Principle 3 about providing access and Principle 5 about providing opportunities for students to construct their own knowledge—that is, the ways in which teachers providing opportunities for students to construct their own knowledge relates to teachers providing access to opportunities to learn.

To encourage PSTs to see the particular *mathematics* that is missing from Teacher B's lesson transcript, I asked PSTs to read it particularly focusing on the treatment of domain. Laura noted that Teacher B did not define domain and then problematized the teaching of vocabulary:

Laura: I think, I mean, it is, we've talked about how vocabulary isn't important. Like you know, with the argue--, we shouldn't, you know, sugar coat things or just make up funny, I can't think of examples right now, but you know make up funny names for things, but use the real vocabulary when teaching our kids, you know. Now I don't think, you know, that it should just be memorizing vocabulary, but they should be using

Brooke: Big B and little B

Laura: Like not just, you know, which way is the alligator's mouth, you know the alligator's mouth opening but you know, greater than less than. They should be saying greater than, less than. (group discussion, May 11, 2010)

Laura discussed the role of vocabulary in detail. First, she said, "We've talked about how vocabulary isn't important," which is likely a reference to discussion in mathematics methods courses about teaching vocabulary in a meaningful way and not devoid of meaning. Laura clarified how she understood the role of vocabulary terms in student learning and its "importance" when she emphasized that teachers should use the "real vocabulary" terms when teaching but not require students to memorize terms. In this manner, Laura emphasized teaching particular content, which is a shift from her previous



emphasis on explorations or teacher actions. She problematized the teaching of vocabulary terms, noting that there were messages from her mathematics methods course about deemphasizing teaching of vocabulary.

In this way, Laura identified a tension between the instructional approach of Teacher B, where there is limited, if any, access to mathematics but which she felt aligned with high standards, and the ways in which Teacher A used the correct vocabulary terms. In this comment, she emphasized Principle 3, related to access to opportunities to learn mathematics, as well as the tension she felt between enacting practices that match both a principle of teaching response in line with “helping students construct knowledge” and principles of access to opportunities to learn, Principles 5 and 3 respectively.

***Describing students’ goals (Session 3).*** In Session 3, PSTs discussed Teacher B’s comment about his students as check-out girls and how teachers and students may have different goals. Taylor and Norah first argued that students should have their own goals; Laura, however, had a different response:

I’m thinking a little bit, like because what Melanie is saying [about student’s age matters for a teacher’s response]. It’s like, it’s okay, like we accept that an 8 year old is like, “I’m going to be famous one day. I’m going to be a football star. You know, I’m going to play for the Ravens.” Like, that’s okay for them to say. We’re like, “Oh, that’s so great.” You know, but, like, if they’re still thinking that in, you know, tenth grade, it’s like whoa, you need a reality check. Like we need to prepare you for life. So, it’s a little bit of that. That, um, if your, so if your nine year old comes up and says you know, “I don’t need math because I’m going to be

famous,” we have to say to them, “Well, everybody still needs math for these reasons,” So um, but it's okay. Like, but, we accept their dreams still. Like it's still okay to have these wild and crazy dreams when you're a little kid. But when you get older, it's not as acceptable. But you still can tell them, like what I would still tell the kid who wants to be a football star, like, “Oh right, you still have to do good, you know. You still will need math in life.” (group discussion, May 11, 2010)

Laura distinguished between an 8-year-old student who dreams of being famous and a tenth-grade student who is “still thinking that,” but across this discussion, she did not articulate different instructional responses, or specifically, the practices that she detailed are the same for both students. She suggested that tenth-grade students’ dreams of being famous are “not as acceptable,” which relates to how she understands the importance of providing students with opportunities and access to opportunities to learn (Principle 3), but it is not clear how she understood her students’ goals or what socially “acceptable” means to her. It is also not clear what elements of mathematics she sees as important “in life.” In this way, Laura identified Principle 3 as significant to her practice but did not specify or problematize mathematics teaching in relation to it. This episode is significant because in comparison to her discussion around giving students challenging mathematics problems and access to opportunities to learn, across this discussion, Laura’s understanding of the implications of how teachers position students in relation to these goals or in what way her response about goals relate to students’ opportunities to learn is less clearly specified.

***Summary of Objective B.*** In the episodes analyzed across this objective, Laura investigated the implications of grouping students by ability, how teachers introduce vocabulary terms, and the related accountability pressures on herself and practices. She also discussed how the ways in which she was positioned by her mentor had implications for her learning opportunities and her understandings of her education coursework. In discussing her teaching, Laura emphasized a tension between the mathematics teaching practices discussed in her coursework and her own instructional practices, on the one hand, and the classroom practices and expectations present in her school context, on the other.

The analysis shows that the expectations and discourses of teacher education as well as the tension in enacting these practices in her context emerge as central in how she understands herself as a mathematics teacher. Laura identified and specified different principles of mathematics teaching, and in particular she identified tensions between some principles, such as the principle of providing students with opportunities to construct knowledge and the principle of providing students with access to opportunities, more generally. She problematized teaching differently in relation to each principle; for example, she was more specific when problematizing grouping students by ability and teaching vocabulary than she was when she problematized setting expectations for her students in needing mathematics.

**Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher.** In this section, I focus on how Laura critiqued social and political discourses in relation to herself as a mathematics

teacher during Sessions 2 and 4, in her written assignment after Session 3, and during her interview. Although Laura discussed the many ways that teachers are positioned and the role of the social, political, and institutional contexts, the relations and tensions between the ElCert program coursework and standards and Laura's mentor and school context emerged as salient to how she was understanding herself as a mathematics teacher. This analysis suggests that Laura repositioned herself in relation to her mentor and her mentors' practices, but did not shift her understanding of herself as a mathematics teacher in relation to the institutional dynamics that she identified in her teaching context.

***Repositioning herself in relation to her mentor (Session 2).*** Laura discussed how she attempted to reposition herself in relation to her mentor's practices by negotiating space to do her own teaching in her mentor's classroom:

I'm always afraid of insulting her that I don't want to do it her way. Does that, like. Like, my mentor is incredible- I'm so appreciative of how flexible she is in letting me do things, but sometimes when I try to talk things out or talk about things that we've learned in our class I'm afraid. I'm always, like walking on eggshells, like I'm scared that by me coming and saying, "Oh well I've learned this or that," I'm insulting her because she doesn't do that it that way, or insinuating that I know better. Um, which for me, it's really that I want to try these things out. You know, I'm not insulting, I want to learn from her and I really want to try what I was learning in class, but it's hard, um, talking sometimes that, I think talking sometimes because it's not really clear um if she doesn't care, but I don't think that she communicates to me um, whether I'm offending her or whether she's like, "I'd be happy to talk about it." It's not clear sometimes.

Sometimes I'll try to say something like and kind of like back away, just, it's a little awkward. (group discussion, April 27, 2010)

Laura described how there is tension in teaching in someone else's classroom, but she also emphasized that she believed in what she was learning in class and would like to try these practices. In this manner, she made efforts to reposition herself not as a mentee in her mentor's classroom, but as a co-teacher.

Laura identified how the structural aspects of the ElCert program served as both resources and constraints for PSTs' negotiation of their positioning. Being a PST in a mentor's classroom made it difficult for her to enact particular practices, but she felt that course assignments in her methods courses gave her authority to teach a lesson in her mentor's classroom in a particular way. During our discussion of the vignette of Mrs. Carlton, Angela, and Benjamin (Appendix K), Laura related her experiences to Angela and discussed how the program gave PSTs some control over their teaching:

Michelle: Didn't Mrs. Carlton tell her that that's what she had to do?

Laura: She did it for her case study. Angela.

Jill: She said, "Sure, you can do your assignment"

Laura: Angela's assignment

Jill: Right

Laura: One assignment

Jill: But, you're right, what does doing the assignment mean? Does having the assignment

Laura: Yes

Jill: actually give her some agency in doing something new? Which is an interesting way to think of it. That like having an assignment is kind like, "Oh I have to because it's an assignment."

Laura: Yes

Jill: is kind of helpful

Laura: Yes

Jill: [laugh] When you are the student

Laura: Yes.

Jill: Like I have to.

Laura: Yes. But, no, when you want to teach in a certain way, like in the fall, we had these big assignments to do, I was like, "Oh, I have to teach a lesson like this," and my teacher's really flexible and open to it, but like I don't feel like quite that same ability when it wasn't for a class. Like, you had to set it on a date, like you know, it was like very comfortable. It was like, "This is for a class." But when, then if you try to even do it yourself, and this is the discourse talking, because if you are trying to do it yourself but your mentor teacher doesn't do it that way, then there is this whole discourses of like, well I don't want you think that I'm saying I'm better than you or this way is better than you. You know, there is like all these things, um, there. So when you have the excuse of a class, like you have so much more room to like maneuver. (group discussion, April 27, 2010)

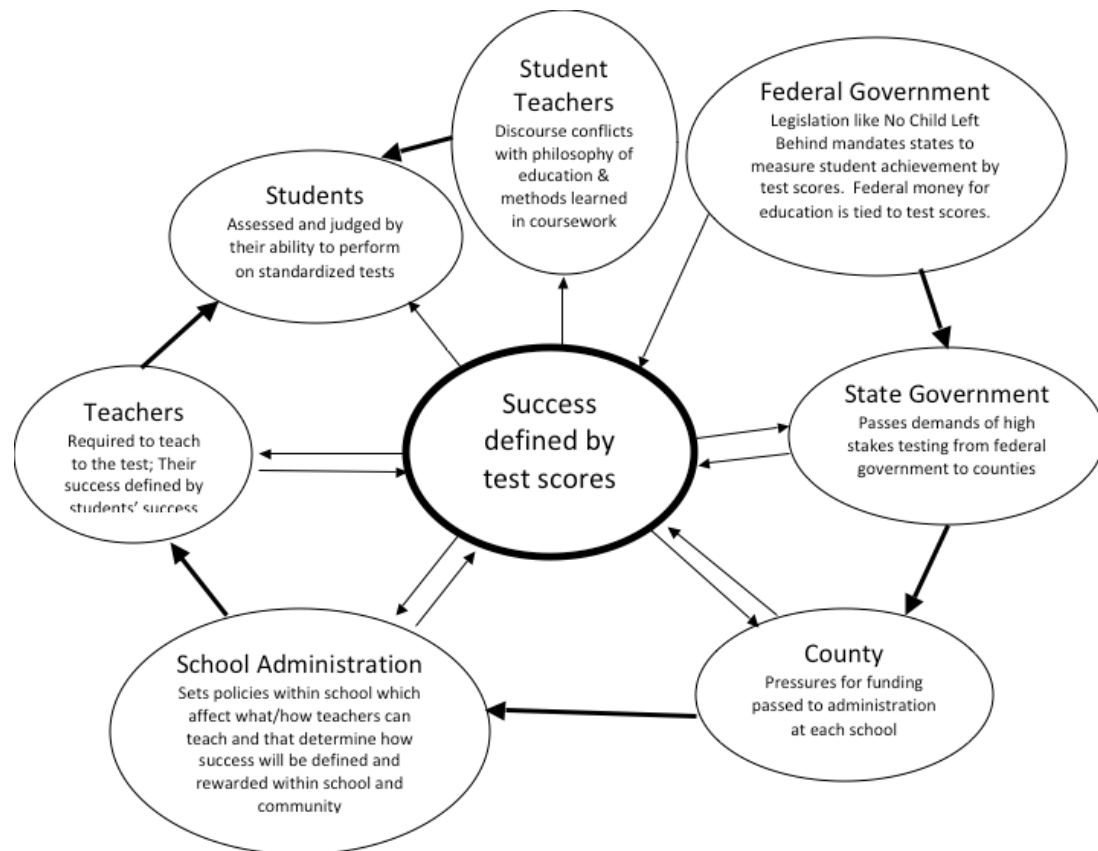
Laura explained how PSTs could lean on their methods courses and use assignments as excuses to enact alternate teaching practices. Because mentors controlled both the extent and nature of PSTs' engagements in their classrooms, however, when assignments were over, PSTs were left again without authority. The expectations of mentor-PST relations constricted Laura's enactment of certain practices, and she was constantly negotiating how to teach in the ways suggested by her coursework. The ways in which Laura identified this tension herself suggests how she is being reflexive about her positioning and repositioning herself.

***Mapping and describing institutional pressures in context (Session 3 and Interview).*** After Session 3, I gave PSTs an assignment asking them to “reflect on two different scenarios and map out” the relations between a prevailing social, institutional or political discourse and the related actors or elements in their school context<sup>36</sup>, specifically, the “between the discourse that you see, the teacher(s), and the student and any other possible actors or elements” (The full prompt is Table 1 on p. 77, and the full lesson plan is in Appendix B). PSTs responded to this prompt by writing short paragraphs or submitting a diagram.

In her response, Laura presented the many ways that a prevailing discourse about standardized testing as defining student success influences and is influenced by students, teachers, and governments (Mapping assignment, May 17, 2010; Figure 4). She did not

---

<sup>36</sup> In Session 3, we revisited the vignette, *Angela, Mrs. Carlton, and Benjamin* (Appendix K). PSTs identified that in the vignette, there was a prevailing way of thinking about teacher interns as students, and in response, Mrs. Carlton positions Angela as a student. Using markers and large chart paper, we mapped this relationship drawing circles to represent each individual and arrows and lines to represent relations and the ways in which individuals were positioned and by whom. PSTs also identified, however, that Angela can position herself as a teacher and not a student, and how Benjamin's mother and Benjamin position Angela differently than Mrs. Carlton, and Angela's position as a student may provide her with more opportunities to help Benjamin. This assignment after Session 3 asked PSTs to engage in a similar activity.



*Figure 5. Laura's map of relations between success as defined by test scores and actors at different levels*

include a narrative supporting this assignment, but her diagram suggests the ways in which she saw student teachers influenced by particular views of students' success and how this influences their relations with students. She also did not draw an arrow back from "student teachers" to the discourse about student success, but there are two arrows from "teachers." This suggests that she did not see student teachers as agentic in responding to or able to influence this prevailing discourse in the same way as teachers. The many two-way arrows suggest how she saw a complicated system of testing and not one individual as encouraging this way of thinking about students. In her map, Laura detailed the many ways that institutional discourses around accountability pressures, standardized testing, and student achievement are relational.



In her interview, Laura explained that the mapping did not represent the pressures in her school context, but rather she wanted to represent how testing “trickles down” and across different actors and to show the many relationships between the different actors:

Jill: This testing, now I don’t think I remember now. You felt, in this mapping of the testing, this isn’t something that you felt at your school?<sup>37</sup>

Laura: No.

Jill: That’s interesting.

Laura: No, it was just something that, when I saw it, I, um, was more something that I always think that we like blame. And then I think like I heard, like there was so much this year, you know about like, testing is always coming up. You know, people were always referencing testing, but I didn’t feel like it applied to me so much. Or people were always like, “Oh, my principal” or the county or like whatever, so I just always felt like there is always someone to blame on it. So, I just wanted to like map it out because if you look, like where is that coming from? And where does that come from? So, really, I guess, if it’s like policy matters, this is an example of why this policy matters and how it affects our daily lives. And this is my poli sci major in college coming in here which is funny because this is like, my first internship ever was like lobbying and I hated it because it was like way to hands off for me, but I still have this

---

<sup>37</sup> Laura completed a first interview with me in early July, and I discovered that my video recorder and audio recorder had both malfunctioned and I did not have a video or audio record of the interview. Laura volunteered to do a second interview. In my field notes from our first interview, I wrote how she did not see this mapping in her school, and my initial comment was awkward because I attempted to ask her the same question.

understanding of why it's important, and I think that this shows like how it all trickles down. (interview, July 16, 2010)

My analysis of Laura's comments suggest how she understood the accountability pressures that teachers feel as in response the federal, state, and district mandates and not only related to school principals and administration. In her mapping and interview, Laura emphasized that understanding students only in terms of their test scores is a system-wide problem that should not be attributed to one actor. When she said that she did not see this at her school, it is not clear that she did not *feel* these pressures; rather, she emphasized in earlier sessions and later in her interview that she did feel these pressures. Laura also cited her political science background, and it is thus unlikely that she would suggest that she is not a part of the system. It is more likely that she did not see all *elements* of this system, such as the federal government or district pressures, in her local context.

Laura's response shows how she was reflexive about her understanding of herself in relation to her context, but Laura did not suggest repositioning herself in relation to these discourses about accountability pressures or recognize the *possibility* for repositioning as including contesting institutional discourses of testing.

***Defining listening to students as repositioning (Session 4).*** During Session 4, PSTs discussed their portfolio presentations, written narratives, and their artifacts of classroom practices that they needed to include in their portfolio. Norah explained how during her internship she did not have consistent opportunities to teach the way that she wanted to teach and felt that her artifacts of practice were not representative of the teacher that she would like to be. Laura described how she struggled with her mentor's

teaching practices and how she planned to address this issue in her portfolio by discussing what she was able to do with students directly:

Maybe my lessons aren't exactly, you know, and the whole classroom structure isn't how I would see it, um, but I'm trying to think of what has been there. And sort of like that's the repositioning that we're able to do. Like, listening, really listening to the students, like I was writing something, um, just now, a little bit on how so much a teachers, I know that we've had conversations about this, where teachers are so quick to write off kids, you know, so what I'm thinking back on this year, something that I really do as a teacher is listen, like actually listen and try to hear what. So I'm going to try to take [my portfolio] more from that perspective as something in my philosophy that I have been able to do this year and like try to find something positive because that, no matter how the classroom is structured, it is still the way that I teach, is like who I am. (group discussion, May 18, 2010)

This comment is consistent with her earlier comment about how the relations with her mentor overshadowed many elements of her experience both in understanding herself and in enacting her own teaching. Laura described herself as contesting how students are positioned in the classroom by listening to students and how this is also repositioning herself in relation to practices in her school and specifically the ways in which the practices of her mentor and other teachers reflected deficit perspectives of students. In this manner, Laura specified how to reposition herself in relation to discourses about students and their difficulties and described herself as agentic in addressing this. This response, in conjunction with her discussion of the “trickle down” influence of testing

(see pp. 344-345), suggests that Laura understands herself as having agency in *her classroom* to confront particular assumptions about students. She also emphasized how determining her own classroom practices was important to her and made her the teacher that she wanted to be: “The way I teach is like who I am”.

***Describing her relationship to test-drive school cultures (Interview).*** During her interview, Laura detailed how she understood herself and her practices as related to her contexts, and in particular as related to the challenges of teaching in a test-driven school. Using a stimulated recall format in this part of the interview, I asked Laura to discuss a comment from Session 1, where she described how she “imagine[d] [herself] as a certain, teaching a certain way but recogniz[ed] that in certain places I can't do that (March 23, 2010).”<sup>38</sup> After I played the video segment, she said that she “definitely thought about that a lot through our meetings, um, because it’s true that there is that tension” (interview, July 16, 2010)

In her interview, she discussed the role of teaching context in her understanding of herself as a teacher, and I analyze segments of her response below (Full response is in Appendix N). Laura described the teaching that she wanted to do and how she did not think that this would be possible in all schools:

Just from what I’ve heard about the schools in Graverly. Like they joke that you have to have the mastery objective up on the wall. And then, that’s not the kind of teaching I want to do, is teaching to the test. So it’s a huge, the schools that you are most likely to get the most freedoms and be the most progressive are the schools that don’t necessarily need you as much. (interview, July 16, 2010)

---

<sup>38</sup> I analyzed this comment in detail in the Objective A section.

Laura articulated particular practices of test-driven school contexts and stated that this is not what she wanted to do. She described how she still felt that she was negotiating a tension about where she could teach and engage in particular practices and how she would not have the same autonomy over her teaching in all contexts. Laura articulated how school context influenced teachers, that is how a teacher's positioning is relational and contextual. Throughout the interview, she focused on her interest in teaching in a school where she would have the opportunities to enact particular practices.

In her interview, Laura recalled how the reading specialist in her school brought up the idea of teaching in underserved schools or in schools where there was a high population of students from low-income families, but she said that she had not thought about it:

But you know I never really thought. I didn't. So I thought about this and then one teacher, and I don't know. I think like when I was younger, I never expected, I didn't go into teaching necessarily because I wanted a certain population. I just really liked school, so I probably imagined being a teacher kind of like what I knew and what I grew up with. So, that's all I had thought about. (interview, July 16, 2010)

Laura described how she understood herself as a teacher in relation to particular contexts, specifically in a neighborhood school, similar to one where she grew up. She identified that her motivations for teaching were originally because of her interests in schooling and positive experiences.

Laura described how the reading specialist defined their school as "a school where they need me" because students were less motivated and parents were less

supportive as compared to other schools in the county. This comment resonated with Laura:

I was like that's interesting. I'd never thought much about that. Um, I think that if anybody asked me why I thought education, even before this, why I thought education was important, and I've kind of always noticed this inconsistency in like the back of my head, is that I would go off and talk about how education is important for all people and everybody needs it. So I have like this whole like more social justice, and this democratic view of, and those are my beliefs about, you know, education, but then that inconsistency in yet I'm not sure that I ever really pictured myself in doing that. I don't know why. I just never thought about it. I just always thought like I'd teach in I guess I have to say I always thought, I'd teach in a school you know more or less a neighborhood, or you know somewhere not too far away. And I think also I that is also part of the thinking that you know teaching would be a good balance of my life and you know you can have kids and like everything would sort of be all like nice and neat [laugh] (interview, July 16, 2010)

Laura suggested that she had not thought of "being needed" as her motivation for being a teacher, and she identified what she called an "inconsistency" between how she understood education as "important for all people" and how she understood herself as a teacher. She said, "I'm not sure that I ever really pictured myself in doing that" (interview, July 16, 2010), meaning that she did not picture herself teaching in a school where she would be serving students in high-needs schools or high-needs areas.

Laura was honest about the tensions that she felt in choosing a school context and the ways in which she felt torn. She identified an awareness of the ways in which ElCert emphasized its mission of teaching for diversity and social justice and the ways that she felt that she ought to want to teach in all schools. In response to what she understood about the importance of education and the views expressed by ElCert, she articulated her commitments to herself and her family and suggested that teaching in particular contexts would not support her in balancing aspects of her life. In this manner, she questioned her own agency in enacting particular practices in certain school contexts or being happy or comfortable in that context. Across the interview, the tension about where to teach is an important issue to Laura, and my analysis shows how she was negotiating how she could enact particular practices across teaching contexts, searching for a school context that is supportive of her practices, in need of her teaching, could support her own happiness.

I asked her explicitly if she felt the same way as the reading specialist, that is, the importance of “being needed.” Laura specified how she would prefer to teach and the importance of her principles of teaching:

Jill: I’m thinking back to what that teacher said. Do you feel like you would need to feel that way?

Laura: I guess that it’d be interesting to me once I started teaching. I think, I don’t know, I don’t know. I think right now for me, and this sounds terrible in some ways and it’s a selfish thing because for me like it’s something that I love to do and like I want to have freedom with it and I want to have independence in how I teach. And I’m doing it for the kids, I’m not doing it for myself, but it’s, I want to be happy doing it. And there

are some things that I don't want to sacrifice and I'm afraid that I would hate teaching. I don't want to go into a place where I would hate teaching. Like in the long run, I'm better off in a place where I have balance and am really happy instead of like go, like a TFA kind of thing, where I'm miserable and never want to teach again. (interview, July 16, 2010)

Laura identified her personal decisions for teaching in particular area as selfish, which suggests how she identified prevailing ways of teachers as “saviors” (e.g., Robertson, 1997). She articulated that she found her teaching practices and principles to be at the core of who she is as a teacher and thus would like to be in a place where she could enact particular practices. Laura did not feel that it was possible for her to happy in all schools.

Across this interview, Laura identified the many ways that teachers are positioned by their context and the ways that PSTs feel social pressure to teach in particular schools. The analysis of this interview does not seek to criticize Laura's honesty about where she wants to teach and her reasoning behind it. Rather, given that she has particular principles of teaching and a goal of supporting a social justice mission in education, analysis suggests that she did not feel agentic in teaching in the ways that she valued in all contexts. She identified a tension between teaching context and the practices that she would like to enact, and she suggested that she had principles of practices that she would like to see as defining herself as a mathematics teacher. She suggested that she could choose a particular type of school context to ensure that she could teach in the manner in which she wanted, but she did not identify ways in which she could reposition herself or recognize the possibilities for repositioning herself in response to the test-driven school cultures across school contexts.



*Summary of Objective C.* Laura identified institutional, political, and social discourses and how they are present in schools, but she repositioned herself in relation to these in different ways. First, Laura actively negotiated the relationship with her mentor in order to teach in a manner consistent with the listed principles and standards that emerge as salient to her self-understandings. She also focused on how her in-class relations with students could serve as means for repositioning herself and her students in relation to deficit perspectives of students, such as the ones that she identified in her mentor's classroom and earlier in relation to Teacher B. The ways in which she repositioned herself in these episodes suggests that she was focusing on her local context and her interactions with students as individuals. Because of this focus, it may have been difficult for her to attend to and negotiate other prevailing discourses about teaching and learning that were prevalent in her school or that she articulated in other assignments.

Laura articulated the institutional discourses of accountability, for example in her map, and in response, she described how she thought it would be challenging, if not inconceivable, to implement particular teaching practices in test-driven school contexts. She framed her own repositioning as about specific actions that she could take in her classroom to reposition herself in relation to deficit perspectives of students, and she articulated that she would choose not teach in test-driven school contexts. It is also significant that she identified these issues of test-based accountability, their system-wide influence, and how they influence teachers' understandings of students, but did not relate these issues to her mentor's practices or hypothesize the relations between these factors that as related to why she sees her mentor not teaching in a particular way.

**Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.** In this section, I describe how Laura analyzed mathematics teaching in relation to her context in Sessions 4 and 5 and in her portfolio. Laura problematized teaching and identified multiple principles that guided her practice, seeking to operationalize ElCert standards in her teaching context. She identified the ways in which different principles of teaching and of schools are in tension. In her final portfolio presentation, Laura situated her principles in her mathematics teaching and presented an example of how she fit these principles together.

*Problematizing student responsibility (Session 4).* In Session 4, we discussed PSTs' classroom artifacts with the goal of situating PSTs' conversations about themselves as teachers in their own practice and supporting PSTs in connecting their practice to implications for student learning. Our discussion of classroom artifacts led to a discussion about grading students' assignments and the ways in which students are responsible for their assignments. Candice described her school's emphasis on responsibility and how the manner in which student responsibility was enforced did not take students' home and family contexts into consideration. She raised an issue of students' accountability for their learning and the importance of teachers attending to student's *understanding*, even as students do not have materials<sup>39</sup>.

After Candice's comment, Josephina offered categorical advice, suggesting teachers should ask students if they had crayons or the necessary materials before sending home assignments. Then, in the following comment, Laura described how asking students about their materials at home did not address an underlying issue of school

---

<sup>39</sup> I analyzed Candice's comment in detail in Chapter 4.

expectations or student responsibility. Laura presented two specific examples that problematized student responsibility and the teacher's role:

It's hard for me to know, like, when at what point, you kind of bring this up with the homework, do they have to start being accountable? Because I mean, there is no reason in my class that I would think that anything—my third graders, just from what I know, they were all going to bring in school supplies and they probably all have crayons at home, but I still had them draw something one day and I asked before because I was like I don't want to assume and I really wanted them to do this in color and like actually, you know not like, put some time into it. And so I asked in front of the group, okay, like does everyone have crayons, okay then I want it in color. And you know it was kind of a situation where you know someone could have just not have spoken up or they could have just sort of agreed because of whatever, but again, like, there's no reason for me to think that kids in that group wouldn't have had crayons, so I kind of just okay. But then of course, they bring in their homework and some kids did a nice job and some kids kind of drew it in pencil, which I specifically said was not okay for this homework. So then again, he was like, "Oh, I didn't have crayons." Okay, so did you not have crayons and you're not telling me or are you being lazy with your homework? And that is what I find a little hard in this third grade period of you're going to be in third grade, you need to do your work, I need to hold you accountable for it, and the other side of me that's like, what's going, wanting to be like, well, like you didn't have crayons and I want to understand that. We've had some other situations, too, with like kids, one kid actually, my diversity case study student,

wouldn't do homework. And again it was like you need to be responsible for doing your homework, but then he'd say things like, "My dad doesn't like me doing it during after care because he likes to be the one doing it." But sometimes, of course, they get home, it's late and the dad doesn't want to take the time to do the homework with him. So he'd always say sort of like, "My dad said I didn't have to do it tonight." You know, again, we're third grade, and well, you need to be responsible for doing it yourself, but you know he's got the parent on the other, so I feel like. That's been a really hard thing this year of finding the middle ground of being compassionate understanding of what's going on at home and also teaching them that you know, because like when they're in middle school, like it doesn't matter, like you're responsible. And they need to learn they're responsibility. For themselves. I don't know, like, how you figure it out. (group discussion, May 18, 2010)

Laura described her practices and the students' responses in detail, thereby specifying both problems and thus allowing others access to these problems in the conversation. She linked both incidents together around a theme of student responsibility, and, in this manner, she engaged in three of the discursive practices of problematizing practice—that is, normalizing a problem of practice, specifying the problem, and linking between problems.

Laura was clear that she believes that students need to be responsible for their work, demonstrating a principle that guided how she understood teaching, student behavior, and school expectations: *Principle 4, Interpreting school expectations*: To be successful in school, students have to resourceful and responsible. She identified that she

understood teaching as supporting students becoming responsible because of the implications for students in future academic situations and the importance of students meeting the expectations set by her school and schools more generally. In this manner, Laura considered issues of access (Principle 3) as related to school expectations and situated school expectations as related to students' future successes and not as baseless or unwarranted. She also identified Principle 2, a principle of interpreting students as having unique backgrounds, both related to academics and as personal to their home and family circumstances. She suggested that these principles are in tension.

Related to but distinct from Principle 4, Laura alluded to another principle in this episode: *Principle 6, Interpreting school expectations*: Teachers must grade accurately. Laura questioned how to “figure it out,” that is, how to grade students and how to hold them accountable, and she sought out strategies and actionable steps to address both Principles 4 and 6. In her interview, she emphasized that she felt pressured to make sure that her grades had “variation. It would be suspicious if everyone got an A” (interview, July 16, 2010). Laura did not use the word “accurately,” but the ways in which she spoke about grading (in sessions and in her interview) suggest that she was searching to assign students grades that honored their work, were impartial, were equitable across students, and allowed her to justify the mark and to maintain her own integrity, as she recognized the flaws of the system. In both Principles 4 and 6, influences of authority and outside expectations emerge as having an influence on how she understood her teaching.

Laura problematized students' responsibility in relation to her actions and her context. She responded differently than Candice who questioned the reasons given for these particular expectations of homework, a variation of Principle 6, and then privileged

students' learning and access to opportunities to learn. Laura did not respond to Candice's emphasis on the system of grading or the ways in which school standards for responsibility may be difficult for students who do not have the same resources, whether it is crayons or electricity, both of which Candice mentioned. In this way, Candice and Laura both problematized practice but they identified different problems and thus different principles

Laura was searching for what grading fairly and accurately could mean *given* these other principles: "You need to do your work, I need to hold you accountable for it, and the other side of me that's like, what's going, wanting to be like, well, like you didn't have crayons and I want to understand that." Laura placed Principle 4 about student responsibility, Principle 6 about her responsibility to hold students accountable, and Principle 2 about understanding students in conflict. She identified the ways in which these principles could work against each other and that Principle 2 in particular was in tension with what she understands about supporting students to be responsible *within* how she interprets the school's set of expectations. Horn and Little (2010) suggested that principles of teaching "almost always position the teachers as agentic in resolving their problems of practice" (p. 198), but in this comment, Laura identified tensions and principles in relation to which she did not feel agentic.

***Problematizing grading student work (Session 4).*** PSTs also discussed grading and evaluating student work in terms of effort grades and letter grades that are a part of their schools' reporting systems. Sarah asserted that her students did not care about written grades, but they cared about her feedback and her verbal or emotional response to their work. She described her practice of giving students opportunities during class to

review her comments on their written work and ask her questions. Sarah framed grading and assessment as including feedback, meaningful communication, and respect for students.

PSTs discussed Sarah's idea at length. Norah and Laura appreciated Sarah's strategy and Candice asked a follow-up question, which led to Laura's particular question:

Candice: Do you allow the kids to redo the work after?

Josephina: That's what I was going to ask you

Sarah: My mentor is really against that, but during takeover I actually let a couple of kids retake a couple of science tests and a social studies test.

Brooke: Tests or writing.

Sarah: Tests. The writing so much like, when I've done big writing projects, it's been four or five steps so it's. I've known the kids who weren't going to be successful at it, so a couple of them, like one, I pulled one of them aside and I said, "You need to put more time into this," and of course, they were all successful. I don't think like any, the last time I did a big project, I think like everyone got like an 80 [percent] or above. And that was really, you know, they went through the whole process. They went through a draft in using several graphic organizers, they did a draft, and they um did peer revisions and they did another draft and that draft was again reviewed by someone. And, you know, I was monitoring them, and

my mentor was monitoring them and the ones who were writing things that didn't make sense, you know, they got feedback on it, all through the process. So for their big assignments, those counted as like test grades or assessments, none of them really needed to

Laura: My question is then-

Jill: Because you had little places to catch them, catch them at different places. You're effectively monitoring their

Laura: But what about the kids that then you, cause I was kind of wondering this—You kind of end up, you know that they got there, not that you wrote it for them, but you really, pushed them there, because you had to go back and sit there and point out like, “You need to rewrite this,” you know. And the kids who get there on their own and so like, because they had help, all the kids, it's great they all have good grades on it, but like, there are differences between those. Like I was wondering about that before, we have, between those good grades, like, a kid who, if he's left to it on his own, he will not put anything down on paper and we've had some problems. And, so a couple of times actually, he goes in a group of kids to the ELL teacher, and we talked to her about it, and there was just one point in the year when we were just really having a hard time getting him to talk to him at one point, and she just pulled him once or a couple times, by himself, and just helped him with his assignments. And, I mean, they were great. But it's so



hard because then, like, there were other kids that were sort of normally on like his level, that were still like maybe getting low grades, and his grade was like up here, but you knew that she really liked pulled that from him. And, I don't know. Grades are weird, right, but I always just wonder. (group discussion, May 18, 2010)

Sarah explained how she allowed students to redo their work, describing her practice in detail and the importance to her of understanding her students' differences (Principle 2) and in allowing all students to have success with the assignment (Principle 3). Laura identified that there are differences between students' understandings, even if their grades are the same, because of the differences in teacher support that the students received. She felt that these differences matter to the teachers, parents, and students. In this manner, she suggested that Sarah's practice was in conflict with Principle 6 about grading students. She did not reject Sarah's practice because of this, but instead, she sought ways to operationalize grading in relation to Principles 2 and 3, or specifically differentiate between the grades while still assessing what students understood about the material or the assignment in particular.

In her work of specifying and generalizing about these principles and practices, Laura engaged in "rough draft talk" (Horn & Little, 2010, p. 195). Rough draft talk has a "provisional sense to it" and includes "pauses," "unfinished sentences, expressions of uncertainty, and explicit revisions" (p. 195). These elements are present in Laura's comment in this episode, for example, when she said, "I was kind of wondering this— You kind of end up, you know that they got there, not that you wrote it for them, but you

really, pushed them there.... And, I don't know. Grades are weird, right, but I always just wonder” (group discussion, May 18, 2010). In discussing practice, Horn and Little (2010) suggested that rough draft talk and revising talk support teacher learning by “providing resources for learning, as it is critical for learners to relate models of teaching to the particulars of unorganized experience” (p. 195). In the revising talk, teachers and PSTs are talking through their experience and their emotions, which supports further understandings and the development of resources for future teaching.

Sarah’s example was about Writer’s Workshop, a particular instructional approach used in language arts where students engage in different elements of the writing process (prewriting, drafting, editing, peer review, etc) at their own pace, many times around topics of interest or students’ choice. Laura was interested in using Writer’s Workshop in her own classroom, and mentioned in her interview when I asked her about what grade she would like to teach. She worried about teaching upper-elementary grades, where assigning students grades would be more high-stakes than in primary grades, and she related this to Writer’s Workshop:

That is exactly, that is my biggest fear with Writer’s Workshop. How do I grade that? They are putting their best work forward, and it would be hard for me to give a range of grades. Like, we want kids to be really proud of this, but really. The grading thing is really hard for me. In my ideal world, every kid would be doing A work, but it can’t. (Interview, July 16, 2010)

Laura emphasized a concern for grading students as related to her comment above, specifying how she felt that she could not give all students an A on their work, but wanted to have students turn in their best work and be proud of it. In this manner, Laura

articulated Principle 6 as influencing how she needed to assign grades that were fair and accurate, but struggled with defining fair and accurate. That is, she described how she felt obligated to work within school wide grading policies, but searched to define what those policies were.

In session 4, Candice responded to Laura's question about how to grade students and shared a related tension in her context:

Candice: It's the same way. Like one of our, in first grade, you grade them like, smiley face, happy face, how, by how independent they are. So, like if you have to help a child a lot, and he comes out with a great product, I can't give him a five or I can't give him a ten because I helped him on so many steps-

Brooke: It's with assistance

Candice: Right, that's like

Laura: I've seen that on [??] report cards.

Candice: And, it's like really, this is school, so shouldn't they all have assistance, if they need it?

Brooke: Not unless they deserve it.

Laura: But I think like it would be good to have that feedback of whether. See, I think they deserve the grade, but I wish that we could give that second grade out of independently or with assistance because I think that it's important to know like, does the kid need extra scaffolding to get to that point or are they working independently?

Jill: And how long, right

Laura: Right. Because the goal is, as they get older, they need to be able to do things independently. That's where we're trying to get them all.

Brooke: exactly

Laura: Because what's going to happen as they get older if they're not working independently? They're not going to have that person sitting next to them, assisting them. I think it's important that kids know, and for the parents also to know, know maybe we're helping him, making sure your kid is getting, like. Actually, we had that, with, we've had this in conferences with parents. They're like, my kid's doing fine, they're getting Cs. Well, they're getting C's with assistance. And then the parents don't understand, like why are you giving my kid assistance? We're like, we're not going to let your kid fail. Um, so I that is an important message to know, you know, whether, how they're getting those grades. Like, just more for the growth of the kid. (group discussion, May 18, 2010).

Candice emphasized Principle 1, suggesting that all students deserve assistance and questioning a standardized system of grading. She emphasized rejecting false notions of difference of grading and treating students as capable.

Laura was concerned with aligning her practice with how she interpreted the set of school expectations, such as Principles 4 and 6. She described how grades serve to inform teachers and parents of students' progress, and in this way, she reasoned about why teachers need to have fair grades. Teachers, Laura suggested, need to know “does

the kid need extra scaffolding to get to that point or are they working independently?” parents need to understand the “growth of the kid,” and students are “not going to have that person sitting next to them, assisting them” (group discussion, May 18, 2010). She articulated that she understood students as unique (Principle 2), but was concerned about the implications of students’ grades for teachers’, parents’, and students’ own understandings of what the student knows. In this way, Laura demonstrated a quest for objectivity and standardization, and sought to operationalize Principles 2, 4, and 6 within the limitations of her school context. She identified that her school context and the fixed grading systems may be in tension with her principles of interpreting students and her principles of teaching response.

*Articulating a teaching philosophy (Portfolio presentation).* Laura used her teaching philosophy to organize her ElCert portfolio, which was consistent with her vision statement and the ElCert standards. The ElCert program required PSTs to create a portfolio and accompanying narrative that aligned with the ElCert standards, and, therefore, it is not surprising that these standards would be apparent when reading Laura’s narrative. What are unique, however, are the ways in which she discussed mathematics teaching, detailed her challenges and students’ challenges, and chose words from the student report cards in her portfolio.

Laura articulated four themes in her philosophy and she used these four themes to structure her narrative:

As I’ve looked back on my year and thought about what is most important to me as a teacher, I found four themes – my personal reasons and passion for teaching, as well as the importance of meeting students’ individual needs, creating

community, and using current research to inform my teaching practices. Through these themes I have begun to develop my own philosophy of education. (Portfolio presentation, June 21, 2010)

Laura situated different ElCert standards into each theme when she presented her portfolio.

Laura described her teaching goals and how she defined her role in relation to her students. She emphasized wanting to “empower students to be independent learners and critical thinkers. For students to really learn and not just memorize information, students must make meaning of what they are learning” (Portfolio presentation, June 21, 2010). These statements are consistent with her vision statement and the emphasis on students’ role in their mathematics learning, as emphasized in the mathematics education community. Laura continued and described specific teaching strategies: “I never like to tell my students anything and use questioning frequently when teaching. I like to provide students with opportunities to explore in order to construct their own ideas and draw their own conclusions” (Portfolio presentation, June 21, 2010). This comment is consistent with her negative reaction to Teacher A and the manner in which he told students the definitions of domain and range. In Session 3, Laura suggested that engaging students in explorations is evidence of high expectations of students, and she also suggested that if Teacher A had included an “exploration,” then his high expectations may have been more apparent.

In describing her mathematics lessons, Laura emphasized student learning in mathematics as meaning-making and not in relation to their standardized assessments:

In math, I was always looking for ways to engage students in learning and to create opportunities for my students to construct knowledge through problem solving....For many of my math students, math was about learning what they had to do to pass the test. I wanted to help them find meaning and deepen their understanding of math. (Portfolio presentation, June 21, 2010)

Laura described how students saw mathematics as related to their standardized assessments and how she wanted to teach with a principle of supporting students in making meaning of the mathematics (Principle 5). She did not discount the importance of passing the test, but emphasized how in reaction to testing, students understand mathematics as learning related to the assessment and not as related to making meaning out of mathematics (Principle 5).

Laura presented a particular mathematics lesson about place value. In this lesson, she described how she created opportunities for students to “construct knowledge” and to “find meaning”:

When teaching about place value, I thought it was important for students to manipulate ones and tens blocks. To help develop their understanding of place value, I asked the students to find multiple ways to represent the number 73 using the blocks. However, before diving into this lesson, the day before I introduced the idea multiple representations of one number by asking the students to see how many ways they could make \$1. In this way, I drew on the students’ previous knowledge and experience with counting coins to prepare the students for a more difficult concept. For both lessons, I gave the students coins or place value blocks to help them count and charts to record their answers. While some students easily

found several combinations of coins, other students struggled to make even one combination of \$1. For many of these students, I found that they gave up easily, and I worked hard to encourage my students to persist with thinking through problems. (Portfolio presentation, June 21, 2010)

Laura described a specific teaching situation and how she created opportunities for her students to learn about place value, thereby problematizing how to engage students in mathematics lessons that “deepen [students’] understanding” of mathematics (Portfolio presentation, June 21, 2010). She identified the importance of student background knowledge, Principle 2, and how she used students’ understandings in her teaching. In this manner, she created access to opportunities for students to develop an understanding of place value (Principle 3) in concert with her principle of emphasizing students as constructing their own knowledge (Principle 5).

In concluding her comment, Laura also emphasized student persistence, which related to Principle 4 and the importance of student responsibility and school expectations<sup>40</sup>. In this manner, Laura addressed multiple principles in this teaching episode, all of which were important to her. For their teaching portfolios, PSTs collected lessons and artifacts that they were most pleased with and felt represented their best practice. It is likely that Laura included this lesson because she felt that she addressed the standards of ElCert and was pleased with this lesson. In this analysis, I suggest that she included many principles of practice and this may have also supported her in understanding this as successful lesson.

---

<sup>40</sup> The phrase “persist with thinking through problems” is from the Eastern County report card. In Session 1, Laura also highlighted this phrase from her report cards and described the “importance of [thinking through problems] for life” (group discussion, March 23, 2010).



***Summary of Objective D.*** Across the episodes in this objective, Laura problematized teaching as related to the multiple expectations of her school context, expectations of ElCert, and the principles she articulated. Laura discussed her own teaching in relation to practices and principles as defined by her school context and the ElCert program specifically. She searched for strategies and actionable steps that fit within existing structures, but noted where principles were in tension and how she did not have actionable steps to address the overlap of principles.

In her demonstration of this objective, influences of authority and outside expectations, such as in Principles 4 and 6, emerged as influential in how Laura understood herself as a teacher. She identified principles as related to teaching response, interpreting students, and school expectations. Across the seminar, Laura was intent on implementing particular practices and principles *within* the set authority structures and institutional discourses, and she understands herself as teaching within the context of teacher education practice and within the requirements of her school context. However, she found this complicated by different understandings of grading. The manner in which she problematized grading suggests that she understood how grading is used for both academic achievement and “academic enabling behaviors, such as responsibility, effort, improvement, participation, and cooperation” (McMillan, Myran, & Workman, 2002, p. 212) and how this leads to inconsistencies across teachers and lack of communication between teachers, parents and students (e.g., Brookhart, 2005). Laura did not suggest a solution to this dilemma, but she engaged in specifying the problem, generalizing to different examples, and problematizing practice in relation to this.

## Discussion/Overview

Laura's understanding of herself as a mathematic teacher (as well as a PST's identity, more generally) is situated in the complexity of her environment. She was reflexive about the contextual and relational elements of her positioning, identifying and specifying the many ways that teaching context influences how teachers and students are positioned in relation to success, mathematics, and their teaching practices. Laura emphasized the role of context in shaping her own teaching and the social and institutional discourses around teachers' understanding of students generally and in relation to Teacher B. It is noteworthy that (and unclear why) she did not identify the ways in which these same forces influenced her mentor or why her mentor did not engage in practices such as problem solving in mathematics or use Writer's Workshop.

PSTs' environments also include the ways in which they are positioned as interns in schools and are expected to "enact the teacher role that is ascribed by the culture generally" (Rodgers & Scott, 200, p. 741). Teacher education and the ElCert program and standards specifically position PSTs and shape their understandings of acceptable responses about self and teaching. During the seminar, Laura's understandings of herself as a mathematics teacher echoed the ElCert standards. The ways in which she included these standards in her written vision statement, reflection on grouping students by ability, and in her talk about her own teaching and her mentor suggest how Laura felt the program standards defined acceptable teaching and how she embraced these standards and principles as her own. The analysis shows that the expectations and discourses of teacher education as well as the tension in enacting these practices in her context emerged as central to how she understood herself as a mathematics teacher.

Laura articulated practices and principles of teaching, and across the seminar, she articulated the following six principles:

- *Principle 1, Responding to students:* When teaching, you have to work towards “rejecting false notions of human difference and actively treating people as equally worthy, complicated, and capable” (Pollock, 2008, p. xx).
- *Principle 2, Interpreting and understanding students:* Students are unique in their academic and cultural backgrounds and have different resources that they can use in mathematics learning.
- *Principle 3, Responding to students:* Teachers need to provide all students with access to opportunities to learn.
- *Principle 4, Interpreting school expectations:* To be successful in school, students have to resourceful and responsible.
- *Principle 5, Responding to students:* Teachers should provide opportunities to students to construct their own knowledge.
- *Principle 6, Interpreting school expectations:* Teachers must grade accurately.

Laura problematized these principles to varying degrees of specificity. She identified tensions between some principles, such as the principle of providing students with opportunities to construct knowledge and the principle of providing students with access to opportunities, more generally. She emphasized practices related to and specified problems of teaching around Principles 2, 3, and 5 more explicitly than the others, and in particular was less explicit about Principle 4. Horn and Little (2010) and Pollock (2008) suggest that clearly articulating a principle and related strategies may support teachers in implementing related actions and strategies. Principles such as Principle 4, about the

importance of student responsibility, also may have been more challenging to operationalize because the role of the teacher in this principle or a specific teacher action is less clear. Horn and Little (2010) stated, “Broad statements of principle need to be evaluated in terms of the agency they grant to teachers. They may not provide much leverage for changing practice if there is no obvious actionable response to be taken by the teacher” (p. 199). She also identified challenges in operationalizing this principle, for example when discussing the student who did not complete his assignment in crayon.

Laura’s multiple principles echo both ElCert standards (Principles 2, 3, and 5, in particular) and the ways in which she understood outside authority structures as influencing and framing her teaching (Principles 4 and 6). In addition to being less clearly articulated, Principles 4 and 6 were not the focus of any of our seminar activities, and it is important to consider if and how Laura may have operationalized these if they had been a more prevalent element of the seminar. In this analysis, Laura identified tensions with fitting these six principles together and thereby engaged in problematizing these principles.

The principles of practice that emerge from analysis of Laura cluster in two categories, one category around the ElCert standards and what she had learned from her coursework and another category around the set expectations of schooling, such as the importance of grading or student responsibility. In relation to gender identity, Butler (1999) discussed how fixed categories, such as gender, influence the manner in which individuals can take up alternative positionings because “the insistence upon the coherence and unity of the category” leads individuals to “effectively refuse the multiplicity of cultural, social, and political intersections” (p. 19) that are present in

constructing any category. That is, in relation to mathematics teacher identity the “coherence and unity of the category” of teacher as established by ElCert and also the coherence that Laura interpreted around the set expectations of schooling may have limited the manner in which she embraced the multiplicity of identity across teaching contexts. This analysis suggests that, for Laura, the manner in which she sought to embrace the particular understandings of self as mathematics teacher that were aligned with the ElCert standards and the prevailing discourses of mathematics teacher education, such as about vocabulary or teaching for understanding, may have restricted her from shifting to understand these principles as overlaid on the ways she interpreted institutional expectations. In order to align her principles and practice, Laura identified particular school contexts that may afford her opportunities to enact both.

Across the seminar, Laura discussed how teaching context influenced and would continue to influence the ways in which she could enact these principles, particularly, Principles 2, 3, and 5, and how she understood herself as a teacher. She problematized teaching and articulated her practices and many related principles, but she emphasized that teaching context would matter for how she would be able to implement these principles. It is significant that Laura did not shift to identify the ways in which she felt that she could understand herself as a mathematics teacher in *multiple* contexts, or specifically in test-driven contexts. She was honest about the tensions that she felt in choosing a school context and how she felt torn

In this manner, Laura’s understandings of herself as a mathematics teacher did not shift in the same ways that her problematizing of teaching shifted. Analytically, repositioning includes identifying and specifying how to reposition oneself, engaging in

repositioning oneself, as well as recognizing the *possibility* for repositioning. Laura identified how she could reposition herself in relation to prevailing discourses of students, for example, in her classroom, or how she could enact practices and principles of ElCert in particular school contexts, such as those that were not defined as test-driven. Laura focused her repositioning on a particular local context, feeling agentic only in certain contexts. Laura engaged in the discursive practices of problematizing teaching and emphasized principles and practices in particular teaching contexts, but it is unclear how engaging in repositioning related to how she was understanding teaching or her options for teaching in line with her principles.

## **Chapter 8: Discussion and Implications**

Each case offers a unique perspective on how PSTs were understanding themselves as mathematics teachers and understanding mathematics teaching and how these understandings were shifting. This chapter addresses three findings across cases and how those findings relate to the research questions. I present details from the cases to explain each finding and address the different ways PSTs' self-understandings of mathematics teacher and teaching emerged and shifted. I explain how each finding contributes to research and practice in mathematics teacher education, in particular to attending to teacher identity and issues of equity in the design and implementation of mathematics teacher education courses. In this chapter, I also reflect on the theoretical premises of performativity and deconstruction as it was used in the development of the seminar and in the framing of the analysis. I conclude with a reflection on the dissertation as a whole.

### **Understanding Themselves Differently**

The first finding is that analysis revealed different themes organizing participating PSTs' perspectives and self-understandings. Through their engagements, in the same space and over the same activities, where issues of race and class, testing and accountability systems, the framing of students' abilities, intern/mentor relations, grading and assessment were discussed, a different theme emerged as salient in each case analysis. This suggests that each PST understood herself differently, and this finding responds to the first research question guiding this dissertation about how PSTs were understanding themselves. The following analytical episode illustrates this finding.

### **Examining practices of grading and evaluating student understanding.**

During Session 4, all four PSTs responded differently to issues of assessing and grading students. In this conversation, many different ideas surfaced: role of parents, what grades meant, how to communicate to students about them, what fairness means, and schools' policies about grades. How each person participated in this conversation is related to the themes emergent in their self-understandings and is representative of their participation across the sessions.

In this analytic episode, Candice, for example, identified what she called the “toothpaste issue,” an incident of a student completing an assignment using toothpaste instead of a gluestick and the teacher throwing the assignment away, dismissing the student's work and effort. Candice criticized her school's strict “no matter what, you have to get this homework done” policy and described how elements of students' socioeconomic situations, such as not having dinner at night or not having electricity at home, impact students' performance. She felt that, “as a teacher, we should know our students enough to know” their situations and what teachers can do to support them. As Candice first identified her student's background and problematized practice in relation to it, this is an example of how race and class were lenses that helped her unpack situations, the ones that she repositioned herself in relation to, and used to problematize practice. Across sessions, Candice shifted to articulate these ideas and operationalize her instructional practice in relation to them, which may have been an influence on her feelings of agency in negotiating these dynamics. She also felt tensions with how to judge students' work and assess it, knowing their academic or family backgrounds, the importance of standardized assessments, and the need for students to achieve at certain



levels. Candice was conflicted and confused, asking in a rhetorical manner “So, how do I *grade* that?”

In response to Candice and her example of the tensions she felt with grading and understanding students’ academic and family backgrounds, Brooke shared her system of using numeric grades combined with pictures (i.e., star, smiley face, check) to assess effort. In this episode and across Brooke’s discursive participation, Brooke sought practices to solve immediate situations, and she struggled to interrogate discourses of test-driven accountability or their intersections with social discourses of race and class. This highlights the challenges Brooke and PSTs have with working at the intersections of these issues and understanding ways to contest their positioning. Brooke’s case highlights how test-driven school cultures create institutional discourses about teaching and students, such as importance of teaching to the test, notions of fixed student abilities and category systems, and then how these discourses *interfere* with teachers’ teaching and learning relationships with children and limit what are seen as possible pedagogical practices. For example, when questioned about her grading practices for her students with special needs and specifically how she and her mentor grade students on their progress, Brooke said, “We just don’t” and emphasized how all students are graded using a rigid set of standards. This is not to criticize how Brooke was positioned or the importance she placed on grading students in a standardized manner; rather, this episode highlights how Brooke understood herself in relation to discourses of test-based accountability systems and was positioned by these discourses. Additionally, her participation highlights how similar conversations encouraged Candice and Brooke’s participation differently.

In this same conversation, Sarah responded to the tensions of grading by discussing how she provided different opportunities to assess students. Sarah, in a manner similar to Brooke, understood herself in relation to and felt constricted by discourses of test-based accountability. Across sessions, Sarah was reflexive about her positioning and demonstrated how she negotiated her positioning as an intern and as a teacher in test-driven contexts. She shifted to articulate that she felt that she could create opportunities that supported student learning, engaged students in long-term projects, and allowed her to dialogue with students about the products they produced before and after giving grades. In this manner, Sarah shifted to work at the intersections of discourses of test-based accountability with other issues in her classroom, such as how students are positioned or how interns are positioned by mentors. Her case suggests that unpacking and contesting the situations around teachers, students, and accountability pressures first is possible and also allowed her to better understand her mentor and her own options for her classroom.

Laura followed Sarah's comment about offering students feedback and support with working and asked about the meanings of grades when students have received different levels of support. Across sessions, Laura consistently asked questions about operationalizing practice when opportunities for this arose, and thus, her self-understanding was rooted in being pragmatic. For example, while her discursive participation was similar to Candice, struggling with tensions of grading, Laura also felt compelled to be consistent even as she wanted to also understand her students' different abilities. When she wondered how Sarah graded students who received different levels of support, her question was not theoretical or to question the system of grading (e.g.,

why grade students), but rather, Laura wanted to know how she could address grading students who have received different levels of support with the current grading system. Laura engaged in self-reflection and was principled in her problematizing of practice, but her repositioning generally remained in seeking to understand her role in the existing systems and institutions of schooling, not to contest social or political discourses of race and class or the institutional constraints. In this manner, she sought to work within the system and understood herself as positioned by her work in her classroom with her students. Different than in the analysis of Brooke, her case highlights the many ways in which PSTs are positioned and how they may understand this positioning as limiting their engagements in new practices or contesting systems of schooling.

**Implications of this finding.** In this analytical episode, each of the four case participants attended to different issues and responded in a manner that was consistent with the theme that emerged across their participation. The fact that each PST gravitated towards different primary issues suggests first that in same space, different themes emerged for each individual. This suggests that PSTs' self-understandings framed their engagements, and thus the importance of attending to PSTs as individuals who draw upon different self-understandings, even in response to same prompts.

There are two major implications for designing and implementing teacher education work in relation to PST mathematics teacher identity. First, as each individual gravitated towards different issues, activities and tasks to support PSTs' identity work need to be varied in order to attend to their various self-understandings and offer a variety of opportunities for participant engagement. The seminar activities as a whole covered many issues related to the sociopolitical contexts of teaching, but how would more

attention to PSTs' own tensions support repositioning or problematizing? For example, Laura held school expectations in tension with the programs' teaching standards, but the program teaching standards and potential tension with school expectations was not exactly a focus of our session. Special education students or inclusion teaching were also not issues specifically discussed, but they emerged in Brooke's participation. How would more attention to these issues have supported them in shifting understandings of teaching?

In addition, threads of continuity across sessions may ground PSTs' self-reflection or identity work. For example, it is significant that Candice maintained attention to issues of race and class across the seminar sessions. Her talk about her teaching and about herself revolved around issues of race and class across sessions, and she sought to reposition herself in relation to everyday antiracism and classism in education. She also leaned on her understandings of racism and classism in order to understand other teachers and their reactions, identifying this theme herself, not as an indictment against other teachers, but identifying how they are positioned and how their identities are an effect of their positioning. Dewey (1938) suggests that continuity and interaction support the learner's educational experience. Did the experiences in the seminar, as many were related to issues of race and class, provide Candice with continuity that proved to be educative? How did this continuity of her learning support Candice in this critical self-reflection? How could PST education leverage this continuity when working with PSTs to understand themselves and their teaching? Or was Candice's own emergent theme necessary for supporting her in this identity work?

While Candice maintained attention to this particular issue across sessions, one issue that emerged across participants was assessing and grading student work. This suggests that discussions of assessment and grading could be leveraged to create continuity to support identity work. How could a focus on assessment be leveraged within mathematics education or across disciplines to support the specifying of practices? Continuity is also of particular importance because this work is with elementary teacher candidates. The participating PSTs saw themselves—and I would say are positioned by schools—as generalists. Attending to their positioning as generalists or responsibilities for teacher different disciplines may help to create some continuity. How would talking about assessment across disciplines allow elementary teachers more ways of thinking about their teaching across disciplines? This also means encouraging program coherence and having these conversations across disciplines. Additionally, discussing assessment, grading, and evaluating student work across disciplines, such as writers’ workshop and Sarah’s idea of communicating with students about their writing, may support PSTs in thinking about how to do this in mathematics.

Taken together, these implications suggest a need for balance in mathematics teacher education. Because of PSTs’ different primary issues, class activities in mathematics teacher education or across teacher education coursework need to offer a variety of opportunities in order to include as many PSTs in the process of deconstruction as possible. Then, there needs to be continuity and connected threads through those opportunities in order to support PSTs in attending to the continuity, as the continuity is important for individuals’ deconstruction.

### **Understandings of Mathematics Teaching as Related to Teaching for Equity**

The second finding of this study is that across the cases, PSTs problematized enacting principles of teaching that emphasized actively treating students as competent (Principle 1), understanding students as having individual strengths and resources (Principle 2), providing students with access to opportunities to learn (Principle 3) in their school contexts. These three principles resonate with NCTM's (2001) Equity Principle, which suggests enacting equitable practices in mathematics education includes having high expectations, responding to student differences, and providing access to rich opportunities to learn. Analysis suggests that PSTs engaged in thinking about these issues more than they were focused on curriculum, classroom resources, or classroom management, for example. This finding responds to both how PSTs understood themselves and how they understood mathematics teaching (research questions 1 and 2) and also suggests relations between how PSTs understood issue of equity in relation to themselves.

While the overarching rationale and purpose of the study was to support PSTs in enacting equitable practices in classrooms, the learning objectives and goals were not limited to issues of race, class, or equity, but attend to the sociopolitical contexts of mathematics teaching broadly and in elementary mathematics teaching in particular. In my design, sociopolitical contexts, while inclusive of race and class, also included grouping students by ability, understanding math ability as fixed, understanding mathematics as a fixed set of knowledge, and understanding teaching as transmission. It is thus significant that their conversations gravitated towards teaching for equity and that in three of the six principles that emerged across participants and across sessions, there

was an emphasis in providing opportunities learn for all students, understanding students' backgrounds and seeing all students as capable.

**Examining practices of grading and evaluating student understanding and progress.** PSTs, however, understood teaching for equity in different ways. This is highlighted in the analytical episode about grading and assessing students that was introduced earlier in this chapter. In this conversation, Candice emphasized both understanding her students' background and resources and supporting them in meeting set objectives. She questioned, "When do they need to be accountable?" and "Why are students at different levels judged against the same measures?" Laura also recognized implications of grading, particularly how the labels about student ability may low teacher expectations even as they also make it easier for teachers to group students and differentiate instruction. She sought practices and principles that would cut across student differences, but she questioned, "How do I grade that?" attempting to find a way to work within current practices consistently and "fairly". Sarah was also specific about providing students with access to opportunities to learn and make sense of mathematics, suggesting balancing problematic tasks and testing. In this manner, Laura and Sarah both discussed how to teach within the system of testing, where Candice was questioning how to have equitable practices and attend to student differences and contesting accountability systems. In contrast, Brooke was not *problematizing* these issues in the same manner, but she mentioned the importance of "having high expectations." This kind of broad statement about high expectations or the practices Sarah and Laura suggested did not interrogate how ideas of fixed notions of difference, racism, or classism create and may

reinforce these structures of student achievement or difference in mathematics achievement and teaching.

**Implications of this finding.** The first implication of this finding is related to how Sarah, Laura, and to some extent, Brooke, understood teaching for equity. Although issues of equity and diversity were addressed in relation to student cases and mathematics, thus in a context-specific manner, across the cases, PSTs' problematizing of teaching revolved around broad statements of equitable practices, such as have high expectations or support all learners. These understandings of teaching for equity may not support PSTs in further problematizing of practice or enacting these practices because they lack specificity. Martin (2003) argued that these broad statements also do not help define equity in mathematics education and even ignore the particularities of student differences: "Blanket statements about *all* students signal an uneasiness or unwillingness to grapple with the complexities and particularities of race, minority/marginalized status, differential treatment, underachievement in deference to the assumption that teaching, curriculum, and learning, and assessment are all that matter" (p. 10). These statements may gloss over the embedded structures in society and mathematics education that create these structures or differences in student achievement or access, for example.

Thus, issues of equity and diversity need to be addressed in mathematics teacher education as explicitly related to school practices, not only as general principles of mathematics teaching or teaching in general but as related to actionable steps: "Equity issues do not arise apart from discussions of mathematics curriculum and instructional practices" (Crockett & Buckley, 2009, p. 179). To encourage PSTs to specify and be explicit, teacher educators and PSTs need to critically analyze school practices and



standards as related to accepted practices and PSTs' opportunities in schools. This means engaging in critical inquiry into the intersections of issues of mathematics, race, class, student differences, and ability in order to encourage PSTs to attend to the mathematics and their students. As PSTs' talk did not always focus on mathematics, how would more focus on mathematics teaching in related to teaching for equity support PSTs in investigating covert and overt tensions these issues create and operationalizing addressing equity in relation to mathematics teaching?

Being explicit could also mean articulating the differences across disciplines. For example, PSTs need more opportunities to understand the ways in which mathematics serves as a highly politicized gatekeeper in their context and to higher level mathematics and elementary teachers' related responsibilities. It is necessary to include more conversations about dominant and critical mathematics identities (e.g., Gutiérrez, 2007). Without the emphasis on these elements of mathematics teaching and learning, PSTs may have taken the mathematics as context, not specifically different than language arts, for example. Highlighting the distinctions between disciplines may have supported PSTs in operationalizing ideas, such as high expectations in a specific manner. This practice of having high expectations may likely look different in mathematics teaching than in language arts teaching, but discussing the ways in which it is similar may support PSTs in integrating ideas such as group discussion, an idea included in language arts classes, into a mathematics class. For example, Sarah's strategy of communicating with students about their written assignments presented her high expectations of her students as learners as well as offered them opportunities to reflect on and learn from her feedback. What would this strategy have looked like in a mathematics class? Then, how would

PSTs' participation be different in a mathematics methods course? Discussing evaluating student work and reporting students progress in a mathematics context may have supported PSTs in thinking about the importance of the student task as well as the importance of teacher assessment both in related to mathematics teaching and in other disciplines.

Integrating discussions of mathematics itself with the seminar activities, such as including a discussion about functions, domain, or range with the conversation about the lesson transcripts and interview statements of Teachers A and B (Appendix E) may have also supported PSTs' understanding of the mathematics in the lesson transcript and the implications of Teacher B's lesson on student understanding. How would this activity have played out differently in a mathematics methods course? What opportunities for supporting PSTs understandings of teaching for equity would have surfaced there? Similarly, a mathematics methods course could have included lessons on probability in the session of *The Wire*. This may have supported PSTs in understanding and reflecting on the teacher's actions. Such as, what does it mean to teach students only about odds? What was not included? What ideas of probabilistic thinking may have been left unchallenged? And even, what would you do in your classroom differently? Integrating these activities within a mathematics methods course may provide more opportunities for implementing lesson teaching assignments.

A more specific focus on individual students and the category systems in schools around students as related to mathematics teaching and assessment may also support PSTs in understanding teaching mathematics equitably and in line with an emphasis on justice. Across PSTs' discursive participation, categories of students, such as "below-

grade level” and “inclusion students” emerged, were used in teacher talk, and accepted by the group as having some explanatory power. Horn (2007) suggested that category systems frame how teachers understand possible pedagogical responses and supporting teachers in understanding mathematics and students may support teachers in problematizing practice differently: “If teachers are given conceptual support to view mathematics in a more connected way, if they are provided with more complex categories of students in discussions about issues in practice, the problem space for teaching shifts accordingly” (p. 74). For example, Horn suggested engaging teachers (and PSTs) in discussions about the ways in which academic status influences students’ participation or about what innate mathematics ability means. Professional development and teacher education that engages teachers in careful examination of student work may support teachers and PSTs to shift from explaining away student differences and relying on category systems to more evidence-based claims that attend to the complexity of student understanding (Horn, 2007). Following one student’s experiences in a school day can also be used by PSTs and in teacher education to better understand student positioning and teachers’ responses to it (e.g., Marsh, 2002). In a mathematics methods course, a case study assignment or a focus on student thinking could be analyzed in relation to student’s disposition about mathematics, teachers’ perception of students’ dispositions and as related to and situated in a social context where students do not feel that they have the capabilities to succeed or see mathematics as related to testing. Addressing equity in context explicitly, attending to student differences, students’ positioning in schools and society (e.g., racism, classism), embedded structures that support this positioning (e.g., issues of access), and the specific actions teachers can take to support students

opportunities to learn may encourage PSTs to attend to the mathematics and be more specific.

A focus on grading and assessment practices in schools may be another way to look at the social positioning of students and how this is enacted in classrooms, further articulating teaching for equity. Issues of grading and evaluating student work, not consistently about mathematics, emerged in PSTs' understandings of self and teaching and this issue is known as particularly complicated in elementary schools. In elementary schools, grading is used for both academic achievement and "academic enabling behaviors, such as responsibility, effort, improvement, participation, and cooperation" (McMillan et al., 2002, p. 212) and how this leads to inconsistencies across teachers and lack of communication between teachers, parents, and students (e.g., Brookhart, 2005). Despite inconsistencies, grading and assessments matter in how students are positioned during and after school, and PSTs may benefit from better understandings of these practices and the implications. For example, how are students' effort grades related to how teachers understand students' racial background or social class, or how teachers understand mathematics or the importance of testing?

Candice problematized teaching for equity differently, in many ways attending to the differences that Laura, for example, was looking to generalize across. This is not an indictment of PSTs' understandings of teaching for equity, but rather it highlights how teaching for equity was understood differently and related to how they understood themselves (i.e., the primary emergent theme). As PSTs engaged in personal deconstruction of their understandings, each PST made meaning of the sociopolitical contexts of schooling in an individualized manner and individual senses of equity

emerged. Then, idea of being a mathematics teacher and mathematics teaching as related to “equity” is also individualized.

This suggests other implications of this finding. If mathematics teacher education seeks to support particular ideas of teaching for equity, such as the importance of access to opportunities to learn or the ways in which mathematics is a highly politicized discipline, then, this finding has implications for designing mathematics teacher education. First, in mathematics teacher education, we need to better understand *how* PSTs see teaching for equity, not feeling as if PSTs’ are taking up the same ideas of equity that are suggested in teacher education or accepting PSTs’ responses about equity as taken-as-shared. Thus, teacher education needs to support shared understandings and operationalizing of practices, building from and incorporating PSTs own understandings, also. Then, class discussions about teaching for equity need to be explicit and respond to individual’s self-understandings and background. In discussions, PSTs need to be consistently encouraged to define what they mean by “high expectations,” “treating kids the *same*,” or “knowing your students,” particularly as this finding suggests that these ideas mean something different to each PST. This may support PSTs in understanding what they can actually *do* in classrooms (Pollock et al., 2010). Explicit attention to equity in mathematics teacher education may support PSTs in implementing these standards and principles of mathematics teacher education and the ElCert standards in particular in their classrooms in a manner consistent with their teacher education coursework. In order to integrate PSTs own self-understandings into these conversations about equity, mathematics, and teaching, continuing to operationalize a critical pedagogy,

specifically encouraging facilitators to build on PSTs' own understandings and identities may support PSTs in specifying teaching for equity.

### **Shifting Understandings of Self as Mathematics Teacher**

The third finding about shifting understandings emphasizes how some PSTs were shifting in their understandings of self and teaching and the different ways it happened. This also responds to the research questions, in particular to how PSTs self-understandings and understandings of teaching were shifting.

**PSTs' shifting understandings of self during seminar sessions.** The focus and nature of these shifts were unique to each PST. The grading episode, as detailed above, highlights Candice's repositioning and problematizing in relation to racism and classism. She specified her relations to these issues as well as included specific classroom instructional practices that she felt were consistent with this repositioning. Candice also presented a sense of awareness of the complexity of her positioning and the positioning of her students, emphasizing how there was not a solution that was going to work for every student.

In this same analytic episode, Brooke was not repositioning herself in relation to issues of test-based accountability or problematizing teaching in relation to these issues. In her final interview, when revisiting her reaction to *The Wire* episode, Brooke, however, presented a more specified position in relation to racism and classism. For example, she articulated *how* race does not matter and how she did not want to involve her students in an "emotional tangle" (interview, July 9, 2010). Brooke specified and detailed her positioning but did not take up new positions or engage in the fixing or unfixing of her understandings of self in relation to issues of race and class. In her work

with exploring nonunitary subjectivities in narratives, Bloom (1996) emphasized the energy and personal insight that goes into retelling a story such as Brooke had done. Bloom found that when asking an interview participant to retell a story, in the retelling, the participant “filled in the omissions” (p. 180) as well as repositioned herself in her story and in relation to the complex issues in her story. Bloom suggested that in the retelling there are elements of (re)presenting oneself that may or may not involve working difference (Ellsworth & Miller, 1996) or repositioning. In the case of Brooke, while there may not be evidence of her repositioning herself in relation to issues of test-based accountability, her retelling of her reaction to *The Wire* suggests further specification if not repositioning or shifting understandings in relation to issues of race and class. This specification matters and may suggest new ways that Brooke thought about issues of race and class (although this was not the emergent theme across her participation).

Sarah’s work of specifying, repositioning, and problematizing, different than Brooke, suggested movement away from her feelings of being constrained by the institutional system in her context. Specifically, Sarah’s comments about giving her students opportunities presented problematizing of practice and repositioning herself in relation to issues of test-based accountability and her mentor’s practices in her classroom. Additionally, across the seminar, Sarah trended towards more specific talk of teaching and of the accountability practices in schools. In her final presentation, she also identified how her mentor teacher was positioned and described how she could both work within and work the system. She felt that she could do certain things that would reposition her students, even if they were not school sanctioned. Analysis of Sarah’s

participation reveals shifting understandings of self as mathematics teacher and suggests that deconstruction supported her in shifting understandings of herself and her teaching. Deconstruction emerged, such as in the above, as a tool that she could use to inform her understanding of others and her decision making.

Laura's engagements in this session also suggest (re)positioning and problematizing in relation to self and context. She problematized practice and repositioned herself in relation to her mentor, contesting particular practices, even if not discussing prevailing issues with the school system that was framing her mentor's practices (e.g., test-based accountability, ability grouping). Across sessions, analysis of Laura suggests some shifting understandings of self, but deconstruction did not emerge as tool for her to use in future situations. For example, although she problematized practices in Sessions 4 and 5, in her final interview, Laura presented two polarized options, where teaching in a context that she deemed as test-driven or that served students from families of lower socioeconomic status was not an option for her because she would not be able to engage in the instructional practices that she wanted and would not be happy. Laura did not present evidence of interrogating the coupling of the place and the practices. Understood through a poststructuralist feminist framework, she did not see teaching across contexts as an option for her or did not feel that she had agency in teaching in those contexts. This finding of shifting understandings across cases is important because it highlighted how PSTs' self-understandings were shifting in different ways. This finding also presents the identity work of some PSTs and suggests that the seminar supported opportunities for this work.



**Implications of this finding.** This finding suggests that PSTs understand themselves as positioned by various discourses in schools and feel that elements of themselves are authored for them. In particular, PSTs' understandings of mathematics teaching are related to their perceptions of students, of individuals, of mathematics, and of testing. This suggests that theorizing of PSTs' understandings of themselves through a theoretical premise of performativity, where individuals' identities are constructed within prevailing discourses (Butler, 1999), can be a lens to understand PST identity. As an implication of this finding for mathematics teacher education, this theoretical premise can be used for understanding and supporting PSTs in self-reflection. The theoretical premises of performativity and deconstruction are discussed more in the following section.

This finding also has implications for thinking about agency, specifically raising questions about this work of repositioning and problematizing in relation to agency. The theoretical perspective of this study suggests that the availability of subject positions, as framed as within prevailing discourses, enables or does not enable certain identities. Deconstruction was hypothesized as a tool for supporting PSTs to become aware of their positioning, making new positions available to them, and also supporting feelings of agency in their teaching or in the taking up of new teaching practices. Sarah and Candice repositioned themselves and took up actionable steps, strategies, and articulated principles of practice consistent with their repositioning. In the manner in which they subverted positionings or identified the possibilities for subverting how they were positioned by institutional discourses of accountability and racism for example, Sarah and

Candice suggested agency for teaching in a manner consistent with the principles they identified.

It is unclear, however, how Brooke and Laura would estimate their agency for engaging in consistent practices consistent with their self-understandings or with the principles they emphasized. Without the repositioning or shifting understandings of self or practice in relation to principles, it is not apparent that they feel more agentic. Pollock et al.'s (2010) three iterations of the question, "What can I do?" speak to and explain some elements of agency. The first question, "What can I *do*?" emphasizes how teachers struggle with actionable steps (i.e., the "doing"). Across this analysis, all of the PSTs struggled with defining actionable steps, but for Candice, Sarah, and Laura, there was a noticeable shift towards identifying actions consistent with their principles. The next question, "What *can* I do?" is about the power of an individual and capacity or in thinking about what is possible. When Sarah and Candice articulated the ways in which they operationalized their principles, they emphasized their capacity as an individual to enact practices consistent with their principles. The third iteration of this question emphasizes the individual, asking, "What can *I* do?", a question about personal readiness. Sarah and Candice's personal readiness was less clear, but both were hopeful in their discussions of practice and themselves. Although across the seminar Sarah and Candice trended towards shifting understandings of themselves and their teaching, there were moments that were not consistent with this shifting, for example, when Candice used the language of labeling students as "on-grade level," language which she contests in other sessions. More detailed analysis is necessary to understand this shifting and when it is or is not happening. In the analysis of Laura, when she articulated the tensions between

principles, Laura also questioned her own capacity for enacting practices consistent with her principles and said that she did not feel confident in enacting her principles in test-driven school contexts. In this manner, Laura's discursive participation did not suggest that deconstruction supported her in shifting understandings of self or her practice. Therefore, in response to this finding, more research is needed on how to support PSTs such as Brooke and Laura, specifically as supporting shifting understandings of self as related to critical self-reflection<sup>41</sup>.

In addition to advancing the theoretical premise behind supporting PSTs, what other actions could I have taken in our seminar? Although I modified seminar sessions and facilitated sessions to be responsive to student needs and took up emerging issues and tensions, this analysis suggests, for example, that Brooke was particularly concerned with her implementing her practices in her local context. How would meeting Brooke's affective needs have supported her in own repositioning and problematizing? In what ways could I have taken up her problem differently and how would that have supported her problematizing? Similarly, Laura illustrated that principles about schooling, school expectations, and the expectations around teachers' practices regulated the ways in which she understood herself and her teaching. The objective of the seminar was to "open up the possibilities for [teacher identity] without dictating which kinds of possibilities ought to be realized" (Butler, 1999, p. viii). Specifically, I sought to support PSTs in raising questions and interrogating the available subject positions, not dictate which positions they should take up. For Laura, however, the ways in which she found the ElCert

---

<sup>41</sup> There is also more research needed in other ways to support PSTs, such as Brooke and Laura, perhaps through creating more opportunities for them to teach in different classrooms or school environments or critically evaluating the mentoring program and identifying mentors that are not only exemplary but match with PSTs' needs. I do not suggest that critical self-examination is the only way to support PSTs, but it was the focus of this study.

standards in tension with the expectations of schools for students and teachers, suggests that there were other issues or expectations framing how she understood herself as a mathematics teacher and her teaching that were not discussed in our seminar. How would attention to different issues have influenced her repositioning or understanding of herself as a mathematics teacher?

### **Reflecting on the Theoretical Premise of Performativity**

This study was interested in understanding the local impact, in this case, on these particular PSTs, and the three findings presented above respond to the research questions guiding this study. This study as a design study (e.g., Barab & Squire, 2004) was also interested in fostering development of useful constructs and testing and refining the theoretical premise and constructs. Specifically, this study sought to test theory and practice in relation to mathematics teacher identity. The theoretical perspective of performativity (Butler, 1999) guided the design of the seminar and the analysis, and consistent with design-based research, I will reflect on this theoretical premise in light of the findings.

Extending the theoretical premise of performativity (Butler, 1999) to mathematics teacher identity suggests that PSTs' mathematics teacher identities involve negotiation of prevailing discourses and personal experiences and are influenced by social norms and expectations which support and influence experiences and actions. Also, as identities are constructed within and shaped by languaged ideas, identities can also be deconstructed and reconstructed. Troubling restrictive discourses and deconstructing identities may be an opportunity to open possibilities to reconstitute teacher identity including new attributes, excluding others, or contesting particular discourses (Butler, 1999).

Unpacking and understanding prevailing discourses that restrict mathematics teacher to certain enactments may present to PSTs new ways of engaging in mathematics or teaching and “permit multiple convergences and divergences without obedience to a normative telos of definitional closure” (Butler, 1999, p. 22).

In this study, I operationalized this theoretical premise in both seminar design and analysis. As overviewed in Chapter 2, educational research includes discussions of mathematics teacher identity, theorizing about relationships between identity and practice, how identity is shaped by previous experiences, or how teacher education can contribute to teacher identity construction. In this manner, research has identified identity as a factor in practice, an outcome of experience, or an objective of teacher education. In this work, identity was not conceptualized as an objective, but I embraced a poststructural feminist perspective on identity, where identity is a process and a mechanism for supporting PSTs’ agency. Applying Butler’s (1999) perspective on identity, I operationalized the theoretical premises of performativity and deconstruction in both the design of the seminar and the analysis. In the following sections, I will discuss the affordances and constraints of using this theoretical premise.

**Performativity as guiding seminar objectives and design.** First, what does this theoretical premise mean for seminar design? The overarching goal of the seminar sessions were to support PSTs in understanding themselves as mathematics teacher and mathematics teaching in context, in particular the social, political, and institutional discourses framing mathematics teachers and teaching and the relations between these discourses to themselves. The rationale was that this self-understanding would lead to agency in mathematics teaching.

From this goal, I designed four objectives from my understandings of performativity and deconstruction, in particular:

- Objective A: Identify and examine the implicit discourses defining mathematics teacher and in teaching situations;
- Objective B: Specify, investigate, and analyze the implications of prevailing discourses and the social, institutional, and political contexts of schools on teaching, students, and teachers;
- Objective C: Critique and respond to prevailing discourses of mathematics teaching and learning or social, political, or institutional discourses of schooling more broadly in relation to self as mathematics teacher; and,
- Objective D: Analyze, question, and evaluate teaching decisions situated in the social and political realities of mathematics teaching.

Objectives were addressed across seminar sessions. While this study did not test the activities, this analysis also suggests that the activities and sessions designed to support this objective may have created opportunities for PSTs to identify and respond to their positioning and the implications, for example. More research is needed on the discursive participation of individuals in relation to each activity, however, in order to make claims about activities.

Across sessions, PSTs also met these objectives differently, and the cases detail how PSTs discursive participation evidenced the objectives. Across cases, analysis of Candice, Sarah, and Laura's discursive participation, particularly their understandings of positioning and their problematizing of teaching presents evidence of meeting Objectives A and B. Operationalizing performativity and deconstruction to focus first on identifying

and examining issues of schools and schooling and then on analyzing implications may have supported their participation, in particular their understandings of self and teaching.

Analysis of Candice, Sarah, and Laura's discursive participation also presents evidence of Objectives C and D and their focus on critiquing and analyzing discourses in relation to self and teaching. In particular, the analysis of Objective D focused on PSTs' repositioning and problematizing of teaching (see Figures 2 and 3 for relations between objectives and analytical tools). Candice's and Sarah's understandings of themselves as mathematics teachers and of teaching, for example, shifted across seminar sessions, as evidenced by how they repositioned themselves in relation to prevailing social and institutional discourses that were framing their understandings of teaching and problematized practice. Their discursive participation in relation to Objective D in particular highlighted their shifting understandings, and their critical analysis of teaching decisions may have supported this shifting.

More broadly, PSTs' responses to the objectives as evidence of identity work suggest the viability of this theoretical premise for designing PST mathematics education. As the objectives detailed elements of deconstruction, and PSTs met these objectives (albeit in different ways), deconstruction can become a tool for PSTs to use in understanding themselves and their contexts. The findings above suggest that performativity provides a theoretical lens for understanding PSTs, while the analysis across PSTs in relation to the objectives suggests how to structure teacher education coursework to support PSTs in identity work and how deconstruction could serve as a tool and process for PSTs for continued work on their understandings.

The seminar, however, did not support all PSTs in the same manner. While the theoretical premise of performativity explains Brooke's understandings of herself as a mathematics teacher, deconstruction as a process did not have the same influence on her discursive participation or feelings of agency for enacting principles as practices in her mathematics classroom. This suggests that more work is needed in operationalizing deconstruction in teacher education, in particular in connecting understandings of contexts to understandings of self and practices.

As a mechanism for supporting PST agency, the role of the theoretical premise of performativity is also unclear. The analysis of Laura's engagement, for example, suggests that she engaged in the processes of deconstruction and critiquing discourses of schooling, but she did not feel more agentic in responding to them. This suggests that more work needs to be done to operationalize the sociopolitical turn in mathematics teacher education (Gutiérrez, 2010) *and* its relationship to PST agency or how to make those connections to instructional practices realized. This is not to question PSTs' capacity for self-analysis or investigation of these issues. Rather, it is not clear that this self-understanding will lead to new understandings of teaching in all contexts. Was the analysis of issues of power and identity simply an intellectual exercise for Laura? It is possible that PSTs' complex positioning in schools may leave them unable to feel agentic in taking up the positions that critical self-examination supports, leaving this analysis as an activity that is not related to their own positioning.

Teacher identity work is complex because of how PSTs are positioned and the contextual dynamics in schools. Together, these elements may limit PSTs' sense of agency, particularly when agency is considered as *subverting* the discourses framing



understandings. For example, Laura developed self-understanding and an awareness of her contexts, which may have helped her better understand how teaching context was a critical element of her teaching practice. Despite the fact that she did not trouble the coupling of the teaching contexts and her teaching practices, her awareness of herself and what she understood as her options or limits may demonstrate Laura being agentic.

**Performativity as guiding seminar facilitation.** The theoretical premise of performativity also necessitated thinking about how to operationalize identity work in practice, that is not only in deciding what the goals or objectives of identity work, but also how to facilitate it. In the facilitation, I situated a stance of critical pedagogy in mathematics teacher education. I worked to balance my own goals and a stance of critical pedagogy, supporting PSTs in their own identity work and engagement in a personally meaningful manner. Critical pedagogy suggests students are “critical co-investigators in dialogue with the teacher” (Freire, 2000, p. 81), and PSTs’ responses suggest that they felt they had learned about themselves and extended our analysis to their own lives.

For example, when asked to describe to another PST what we did in the seminar, both Sarah and Laura said that they would explain that we discussed “dilemmas of teaching.” Laura defined these dilemmas as challenges or decisions she had to make. All four of the participating PSTs described our seminar as important part of their experience with ElCert. Laura and Sarah used the word “helpful” in describing how our sessions pushed their thinking:

These meetings have been helpful in allowing me opportunities to engage in interesting and thought provoking conversation with my peers and to reflect on

this past year's experiences. I have not only reflected on my teaching in regards to mathematics, but also in relation to other subjects and to the classroom as a whole. (Laura, Written reflection after Session 4, May 31, 2010)

I am finding [our seminar] helpful because it is forcing me to think about things I would not have thought about. I know you are taping the sessions, but I feel like I can be honest and say things that I would not say in any other situation (Things about my mentor, my placement school, the ElCert program...). (Written reflection after Session 4, May 27, 2010)

Laura and Sarah appreciated the seminar as a space to discuss with others and to reflect on their own understandings both about their teaching and across their experiences as a whole. Their responses suggest that they felt that it was a meaningful seminar and that they felt were engaged in elements of a critical pedagogy, specifically troubling practices and self-reflecting. Their responses also suggest that PSTs need continued opportunities for critical self-reflection about their internship experiences and teacher education coursework. In particular, these opportunities may support PSTs in attending to the standards and expectations of teacher education as specific to content areas, including but not limited to issues of equity, and *in relation to* their classroom experiences.

Their responses above suggests that a critical pedagogy in mathematics teacher education, where individuals are challenged to think critically about social and political norms and relate these ideas to self, may be a meaningful stance for this work. In their written reflections, Brooke and Candice also emphasized the importance of this seminar to their self-understanding and self-concept:

Okay, Jill, not to give you too much hot air, but I think I have genuinely learned more about myself as a teacher through this reflection group than anywhere else.

(Brooke, written reflection after Session 4, May 31, 2010)

I appreciated you taking the time to listen to me. I just put it out of my mind but I think I needed to deal with it. Today was my closure. Thank you for allowing me to talk and talk even on tangents. (Candice, personal communication, July 9, 2010)

Their comments emphasize how they found their participation meaningful, and they suggest that the content as well as the nature of our work was important for their learning and self-understanding. I contend that the critical pedagogy stance that informed the seminar sessions and my facilitation related to participating PSTs' reactions.

There are certainly ways in which I would improve the facilitation of sessions. For example, more explicitly outlining the goal of the session or the rationale of the activities may have supported PSTs' engagement. Before the session where we discussed Teachers A and B, I said that the goal was to think about teachers' beliefs and practices, but I did not emphasize that we were going to talk about issues of access to mathematics or how classism emerges in teacher talk, for example. I chose not to outline the specific session goals because I sought to balance my own viewpoint and with PSTs' critical self-reflection on how they and others are positioned within discourses, thereby offering an opportunity for them to "bring this knowledge to bear on his or her own sense of self" (Kumashiro, 2000, p. 45). As Kumashiro emphasized, "Critical pedagogy needs to move away from saying that students need this/my critical perspective since such an approach merely replaces one (socially hegemonic) framework for seeing the world with another

(academically hegemonic) one” (p. 39). Explaining the specific rationale for activities may have explicitly included PSTs as “critical co-investigators (Freire, 2000, p. 81) and supported their engagement, for example in attending to issues of class. More explicit attention to how teachers are positioned and how they are positioning students may have supported Brooke during this conversation, specifically.

The specific prompts guiding my facilitation also afforded PSTs different opportunities to engage in self-reflection and problematize teaching. For example, my discussion prompts as related to the activity about Teachers A and B were more scaffolded as compared to my prompts related to our viewing of *The Wire*. The scaffolded prompts may have offered PSTs more opportunities for teacher talk across levels and about themselves. In the facilitation, the prompts also offered me more opportunities to encourage the conversation explicitly while allowing PSTs opportunities to respond; that is, the prompts gave me direction without answering the questions myself. Consistent with research on high quality professional development (e.g., Hawley & Valli, 2007), using PSTs own artifacts of practice and encouraging job-embedded questions may have supported PSTs’ discursive participation. Although this seminar was consistent with a critical pedagogy, in design and specifically as suggested by PSTs’ responses, more research is needed in understanding how to operationalize this charge, particularly as certain issues, such as equity, emerged as needing explicit attention in coursework.

Facilitating a critical pedagogy itself is complicated and requires instructors to take up new positions as a mathematics teacher educator. Facilitators are integral and obvious participants in these discussions, shaping PSTs’ engagements, investing in some

questions, and repressing others (Fine, 2007). I was uniquely positioned as a graduate student, researcher, and teacher educator. Even as the seminar was not for course credit, PSTs were positioned as students within a classroom setting. From the viewpoint of the PSTs, I also had a connection with their other instructors and they felt that I could ask them questions that they could not ask. How did my own positioning in relation to the University and my research influence this research and their engagements?

I am also a White, middle-class woman. All of the participating PSTs in our seminar were also women, eight were White, one self-identified as African-American, and one self-identified as an immigrant from Argentina. Consistent with research around talk about race and ethnicity in schools, our initial conversations about race were more muted where race was implied (e.g., Pollock, 2001), as compared to Session 6, where race was explicitly mentioned. It is interesting that Brooke, who was also White, was comfortable telling me that she did not see race in her classroom. Would she have reacted the same way if I had been a person of color? We did not discuss gender in our seminar, and it is interesting to notice what is taken for granted and what is not. Wilkenson and Kitzinger (2003) suggested some positions may be invisible in interactions because they are normative and “become visible only when there is some resistance to or challenge of them” (p. 176). Future research should examine both the normative and non-normative positions for understanding power relationships and how positionality is implicated in the process of implementing a critical pedagogy.

Researchers who have both embraced and critiqued critical pedagogy (e.g., Ellsworth, 1989; Luke, 1992) warn that educators must be wary of pushing a viewpoint onto students. In situating my views about mathematics teaching and learning in PSTs’

dynamics and seeking to support PSTs in their (re)authoring, I sought to provide space for PSTs' struggles with problematizing practices and understanding themselves and to resist providing my interpretations of their struggles. As they asked for "answers" to their struggles, I felt pressure to provide "solutions." I also struggled when I pushed them to engage in tough conversations about the sociopolitical contexts of mathematics teaching and their relations to these issues, and I struggled with the silence, feelings of inadequacy, or feeling of being irresponsible when I did not. That is, engaging PSTs in this work was complicated by my own positioning as well as theirs. This *is* the complex work of engaging in a critical pedagogy and it cannot and should not be avoided.

Teacher education needs to continue problematizing how to implement a stance of critical pedagogy in mathematics education with a focus on teaching for equity without introducing other hegemonic discourses. Facilitators, thus, need to prepare for PSTs' questions and engagements in order to do justice to issue of race and culture in classrooms and to allow opportunities for PSTs to engage in their own inquiry as well (Milner, 2007). As teacher education is often a place of research and practice, how can researchers and facilitators "work through dangers seen, unseen, and unforeseen in the practice of their inquiry, especially to do justice to issues of race and culture?" (Milner, 2007, p. 389). How could a stance of critical pedagogy be implemented in mathematics education with a focus on teaching for equity without introducing other hegemonic discourses?

**Performativity as guiding analysis.** In addition to discussing what the theoretical stance of performativity means for seminar design, what does this theoretical premise mean for my analysis? Taking on the theoretical perspective of performativity

first allowed me to move away from the idea of role. Through a lens of performativity, I focused on how nonunitary subjectivity is produced and the ways in which PSTs' self-understandings are complex and changing. This perspective served to better explain for example how Laura felt that there were multiple pressures influencing her understanding of self as a mathematics teacher. Moving away from identity as operationalized through the idea of "role," the concept of positioning focused "attention on the dynamic aspects of encounters in contrast to the way in which the use of 'role' serves to highlight static, formal and ritualistic aspects" (Davies & Harre, 1990, p. 43). Through focusing on the discursive practices and how they constitute the speakers, this perspective embraced both continuities and discontinuities in productions of self in conversations with others: "An individual emerges through the processes of social interaction, not as a relatively fixed end product but as one who is constituted and reconstituted through the various discursive practices in which they participated" (Davies & Harre, 1990, p. 45). This understanding of identity through positioning presents PSTs as agents in their own identity within the prevailing norms and discourses regulating their actions, as well as aligns with a view of identity as enacted, dynamic, and socially situated.

From this theoretical premise, I specifically operationalized ideas of working difference and repositioning (Ellsworth & Miller, 1996). The analysis, as operationalized, theoretically, in line with performativity, allowed me to understand how each individual was understanding herself and what emerged as salient. My analytical lens allowed me to see the emergent themes in their self-understandings, an affordance of the theory. The analysis did not allow for comparison across individuals along the same issue or allow me to see all of the ways in which PSTs' self-understandings were shifting

or compare their shifting (e.g., Brooke to Candice). For example, there is more evidence both within and across sessions of Candice repositioning herself in relation to her emergent theme. Across sessions, the theme that emerged across Brooke's participation was in relation to the pressures and constraints of test-based accountability, but she also specified her positioning in interesting ways in relation to discourses of race and class. This was not the theme that I established was across her participation, and by limiting my analysis to one theme, I did not engage in a detailed analysis of her positioning in relation to issues of race and class.

Consistent my theoretical framework, I chose not to analyze individual's repositioning as *directional*, and this did not allow for a normative response to PSTs' repositioning. Attending to *repositioning* was identifying, specifying, or explaining the actions that one has to take in order to subvert or contest a particular discourse. These actions—and in my analysis, also the identifying and specifying of the *possibilities* for repositioning—suggest repositioning or shifting understandings of self. By not choosing to analyze this work in a direction, I am limited in what I can say about Brooke's repositioning in relation to test-based accountability. For example, while Brooke specified her relations to this discourse, she did so in a manner that did not contest accountability systems, how they position students, or how they perpetuate inequalities. Following Butler (1999) and the theoretical premise of performativity, sessions sought to problematize sociopolitical contexts of mathematics teaching and the discourses and practices available in the effort to subvert dominant discourses, such as a reliance on test-based accountability, or what Brooke called the “math class hierarchy”. This analysis cannot attend to direction, and the analysis does not reveal how her repositioning was



movement towards a more complex understanding of testing or not. This is another constraint of this theory and particularly in how I operationalized it.

Analysis of PSTs' discursive participation from different angles may present different findings about PSTs' problematizing and repositioning. For example, contrasting the cases may show differences in PSTs' problematizing of teaching and suggest more ideas for practice. Or, through a critical race theory perspective, in what way are Candice and Brooke presenting narratives and counter narratives to issues of race in classrooms? How could presenting these narratives and counternarratives help to support teacher educators in understanding both White PSTs and PSTs of color?

## **Conclusion**

I engaged in this work because I saw identity as an issue that I needed help in negotiating as a novice teacher and continued to negotiate as a graduate student. Through this work, I have seen the multiple ways that my own understandings of myself as mathematics teacher educator are situated in particular discourses about mathematics, equity, roles of instructor, and graduate student, and the ways in which I did and did not negotiate how I was positioned or how I position myself in relation to these discourses across time and contexts.

Before beginning this study, I identified my views of mathematics teaching as a process of engaging students in rich mathematics, and in my mathematics methods course, I emphasized pushing against discourses of mathematics as skills that I saw as perpetuated by accountability pressures. I wanted to integrate and encourage PSTs to see the possibilities in integrating particular perspectives of mathematics into the constraints of test-based accountability pressures and curriculum in schools. I also strongly believed

in the importance of educating all students, which meant both providing access to opportunities to learn and contesting system-wide constraints to student learning and positioning, such as school practices that label students on the basis of standardized test scores and then use those labels for unintended purposes.

In this study, I had to reposition myself against particular views of mathematics teacher educator. This did not mean that I had to abandon my views about mathematics teaching and learning, but in situating these conversations in other dynamics and wanting to support PSTs in (re)authoring their own voices, I needed to provide space for PSTs' struggles with problematizing practices and understanding themselves and resist providing my interpretations of their struggles. The role of teacher educator and my struggle with repositioning myself in order to balance these roles with the perspectives and premises of critical pedagogy would have been the salient issue that would have emerged if I had completed an analysis of my own understanding of self as mathematics teacher educator. Evidence of my repositioning in relation to this issue would have been tied to particular episodes, notably when I felt most confident, such as in the conversation about Teachers A and B.

Engaging PSTs in this work was complicated by my own positioning as well as theirs, and I sought to continue to negotiate my relations to work throughout the seminar and analysis. During this seminar and period of study, there were, of course, other discourses and perspectives—views of researcher, student, White woman, etc.—that I negotiated. For example, the first session of this seminar was six weeks after the birth of my daughter, and I took on the responsibility, excitement, and pressure of being a mother. There are certainly influences on the participating PSTs and different discourses and

perspectives position them in many ways that are not discussed here. Butler (1999) emphasized that even as list of an individual's attributes or positionings is always incomplete, it is important to embrace the multiplicity of identity. The incomplete labeling of self should be interpreted as instructive and encouraging:

The theories of feminist identity that elaborate predicates of color, sexuality, ethnicity, class, and able-bodiedness invariably close with an embarrassed "etc." at the end of the list. Through this horizontal trajectory of adjectives, these positions strive to encompass a situated subject, but invariably fail to be complete. This failure, however, is instructive: what political impetus is to be derived from the exasperated "etc." that so often occurs at the end of such lines? This is sign of exhaustion as well as of the *illimitable process of signification itself*. It is the *supplement*, the excess that necessarily accompanies any effort to posit identity once and for all. This illimitable *et cetera*, however, offers itself a new departure for feminist political theorizing. (p. 196)

There are thus unlimited possibilities for (re)positioning oneself, which emphasizes the fluid and negotiated characteristics of teacher identity. Mathematics teacher education has a responsibility to support PSTs in working towards an awareness of this nature of identity and the possibilities, and in particular in feeling agentic as they navigate the multiple demands and forces that are shaping their understandings of self and teaching. This research has encouraged me to continue to articulate how I am positioned as well as understand my students, and I seek to engage in this deconstruction myself.

## Appendix A

### ElCert Program Mission Statement and Standards

The ElCert program conceives of teaching as listening and responding to individual students, their context, and the curriculum in ways that facilitate student thinking, foster and honor classroom community, and promote understanding of disciplines. Our program aims to develop teachers who can navigate the dilemmas and complexities of teaching and learning and are able to develop and exercise professional judgment and cultural proficiency in the pursuit of furthering student learning. We seek to prepare teachers for successful careers in public schools with culturally, linguistically or economically diverse student populations.

### Elementary Program Standards

<b>Professionalism &amp; Collaboration</b>	
<b>Professional disposition</b>	The teacher candidate exhibits the fundamental disposition of being a learner, demonstrating the commitment to learning and curiosity about his/her students and student thinking and cultivating a learning community that respects diversity
<b>Parent relationships and communication</b>	The teacher candidate maintains productive relationships with parents/guardians and seeks to develop cooperation in support of student motivation and learning
<b>Collaborates with colleagues</b>	The teacher candidate participates in collaborative activities designed to make the school a productive learning environment for students, parents, staff, and administrators. The teacher candidate collaborates with special services staff (e.g. ESOL teachers, special education teachers, counselors, curriculum specialists, instructional aides) to maintain a productive learning environment
<b>Engages with community</b>	The teacher candidate demonstrates a commitment to understanding the community that the school serves.
<b>Engages in inquiry and reflection</b>	The teacher candidate engages in inquiry that reflects understanding of the larger sociopolitical context of teaching, and demonstrates self-awareness, efficacy, and a commitment to ongoing inquiry into one's own teaching and learning.

<b>Planning, Delivery, &amp; Assessment</b>
<p><b>Addresses Individual Differences</b></p> <p>The teacher candidate assesses individual differences through a variety of formal and informal techniques then designs and implements differentiated instruction appropriate to students' stages of development, cultural backgrounds, strengths, and needs.</p>
<p><b>Critically Evaluates Teaching Resources</b></p> <p>The teacher critically evaluates electronic and curriculum based resources for their comprehensiveness, accuracy, and perspectives, and translates formal curricular objectives into meaningful learning goals.</p>
<p><b>Uses Culturally Diverse Resources</b></p> <p>The teacher candidate integrates culturally diverse perspectives and resources, including those from the learners, their families and communities, into the curriculum.</p>
<p><b>Uses Specific Disciplinary Principles to Provide Effective Instruction</b></p> <p>The teacher candidate plans for and provides learning experiences that are based on principles of effective instruction and pedagogical content knowledge that meets the expectations (structures and priorities) of the various disciplinary areas.</p>
<p><b>Integrates Content Areas</b></p> <p>The teacher candidate creates interdisciplinary learning experiences that allow students to integrate knowledge, experiences, skills, and methods of inquiry across subject areas.</p>
<p><b>Effectively Uses Technology and Media Tools</b></p> <p>The teacher candidate enhances student learning by using a variety of current technology and media tools in planning and teaching.</p>
<p><b>Demonstrates Instructional Flexibility</b></p> <p>During the delivery of a lesson, the teacher candidate pays close attention to students and responds flexibly by adapting instruction effectively in the moment.</p>
<p><b>Assesses Student Learning</b></p> <p>The teacher candidate accesses the appropriate technology and uses a variety of formal and informal assessment techniques for formative and summative assessments of students' learning, analyzes the data, to make instructional decisions and modifications of teaching strategies.</p>
<p><b>Classroom Management</b></p> <p>The teacher candidate cultivates and facilitates learning environments that encourage students' social interaction, active engagement in learning, and motivation.</p>
<p><b>Effectively Sequences Lessons and Units</b></p> <p>In considering a given curricular framework, the teacher candidate effectively maps out a single unit and develops sequential, daily lesson plans</p>
<p><b>Maintains Records and Communicates Progress</b></p> <p>The teacher candidate maintains <b>electronic</b> records of student performance and can use technology to effectively communicate student progress both formally and informally to students, parents, and colleagues in person.</p>

## Appendix B

### Session Plans for Sessions 1 through 8

#### Session 1: Linguaging discourses

- A. Objectives: A and B
- B. Materials
  - 1. Handouts
    - a. *Algebra for All* vignette (modified from Crockett, 2008) (Appendix C)
    - b. Writing prompts and discussion board instructions
  - 2. Large poster paper and markers
  - 3. Audio and video recorders
- C. Session Outline
  - 1. Introduction
    - a. Describe study and logistics
    - b. Emphasize overarching goal of thinking critically about themselves and how this relates to students, mathematics teaching and learning, schools, etc.
  - 2. Read and discuss *Algebra for All* case (modified from Crockett, 2008).  
Use the following guiding prompts:
    - a. How is mathematics seen by Tara, by Mr. Wilson, by the district or by others?
    - b. What are the different views of mathematics? Be specific. What is your evidence of this influence?
    - c. What is driving Mrs. Johnson to react to the discussion in the way that she does? Mr. Jones? Tara? Be specific. What is your evidence of this influence? Where do you think their beliefs come from?
    - d. How are students perceived by the different teachers in this case? Be specific. What do their perceptions of students mean for teaching algebra?
  - 3. Discuss and name emergent social, political, and institutional discourses (e.g. discourse map, Alsup, 2006).
    - a. “The goal is to try to name these different influences or forces so we can see how they are influencing the actors here and really teachers and students more broadly.”
    - b. “These influences or social, historical, political forces organize a way of thinking into a way of acting in the world. What you have named are forces outside the individual, structures of statements, beliefs, categories that influence the individual, shape understandings and actions. Think of these as messages or ways of talking; they are discourses because they are evident in talk and then shape future actions and talk. An example of a discourse is a way of talking about boys as boisterous and then that is used as a way to justify and explain different behaviors...”

- c. Name and organize the discourses that they find in the case. “I will write these down and post them to the group discussion board.” What discourses about mathematics/teaching/students are influencing Tara/veteran teachers? How does this case make you feel?
- 4. Reflective prompt: What is your vision of yourself teaching mathematics in five years?
- 5. Group discussion: How do any of these forces relate to what you wrote about? Are there other discourses that come into play? Are there other forces that shape what you are thinking? Review your vision. How do you think that you came to these understandings?
- 6. Overview study again and my personal interests in supporting new teachers.
- 7. Before the next session
  - i. Writing prompts: 1) How do these discourses—the ones that we talked about in Session 1 and any others—influence your teaching, yourself as teacher or your students? 2) Where do you see these discourses in your classroom now?
  - ii. Post vision statement
- D. Follow-up after session
  - 1. Review PSTs’ first writing about vision
  - 2. Respond to their reflective writing piece about discourses
  - 3. Content-log all videos
  - 4. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  - 5. Plan homework handout for Session 2.
  - 6. Post copies of discussion

## **Session 2: Introducing positioning and situating discourses**

- A. Objectives: A and B
- B. Materials
  - 1. Handouts
    - a. *Angela, Mrs. Carlton, and Benjamin* vignette (modified from Crockett, 2008) (Appendix D)
    - b. Writing prompts and discussion board instructions
  - 2. *Alchemy of race and rights* (Williams, 1991)
  - 3. *The paper bag princess* (Munsch, 1992)
  - 4. Large poster paper and markers
  - 5. Audio and video recorders
- C. Session Outline
  - 1. Review prompts and observations
    - a. Look at the discourse list from last time. How should we clarify this? What does this mean? I put words to this last time- does this actually capture what you mean?
    - b. How do you see these as influencing your teaching?

- c. How do the words here capture what you feel?
  - d. Would you like to reword any of these?
  - e. How was the experience of thinking about your own teaching as influenced by discourses? How did this feel? How was it trying to see your students this way?
2. Introduce positioning
  - a. Before we begin, what is a prevailing discourse about princesses? About princes? Read *The paper bag princess* (Munsch, 1992). How is Elizabeth positioned? How does she position or reposition herself?
  - b. Read excerpt from *Alchemy of race and rights* (Williams, 1991). How is she positioned outside of Benetton the first time? The second time? What does she do? What discourses have positioned her and how is she positioned? How does she reposition herself?
  - c. Write definition from Davies and Harre (1990) and discuss.
3. Reflect on positioning as a mathematics teacher and revisit discourse list
  - a. “How do you feel positioned as a math teacher or in your math classroom? And how do you position yourself as a math teacher or in your math classroom?” Do think-pair-share. Emphasize positive positionings. How does your mentor teacher position you in positive way?
  - b. Have PSTs write their responses.
  - c. Share my example. I feel positioned by a discourse of mother and what that looks like. That being a mother has some meanings behind it; it may mean being home, doing laundry, and having dinner on the table and I sometimes struggle with how this feels... When asked, “How do you find time to work?” or “Don’t you miss your time at home?” I sometimes feel like I’m being positioned as a certain type of mother or student.
  - d. Discuss and relate to the prevailing discourses above.
4. Read *Angela, Mrs. Carlton, and Benjamin* case (modified from Crockett, 2008).
  - a. What do you think that Angela should do? Why?
  - b. What are the discourses here?
  - c. Who is being positioned? In relation to which discourses? (e.g., discourses of mathematics as skills and procedures to follow (not math at home); discourses about who are mathematics learners (who are parents?); discourses of testing/achievement; discourse of
  - d. What evidence do you see for the positioning? What aspects of the language/action are used and what do they accomplish? Be specific.
5. Before the next session
  - a. Writing prompts: 1) How do you feel positioned as a math teacher or in your math classroom? And how do you position yourself as a math teacher or in your math classroom? 2) Reflecting back on how Angela is positioned, how she positions herself and how she



positions others, what would you do in her place? Why? Be specific.

- D. Follow-up after session
  - 1. Review PSTs' reflective writing about their positioning
  - 2. Content-log all videos
  - 3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  - 4. Plan homework handout for Session 3.
  - 5. Post copies of discussion

### **Session 3: Implications of positioning on students and teachers**

- A. Objectives: B and C
- B. Materials
  - 1. Handouts
    - a. *Teacher A and Teacher B* (modified from de Freitas & Zolkower, 2009) (Appendix E)
    - b. Writing prompts
  - 2. Large poster paper and markers
  - 3. Audio and video recorders
- C. Session Outline
  - 1. Map social, political, and institutional discourses present in *Angela, Mrs. Carlton, and Benjamin* case, and discuss implications on individuals.
    - a. What could be shaping the interaction in this case?
    - b. One that many of you mentioned was the novice/expert idea and how Angela is positioned by the discourse of interns as students, not as head teachers. Let's take this and map it.
    - c. Is there another discourse? Let's take this and map it. Using this discourse, Benjamin, Angela, Mrs. Carlton.
  - 2. Transcript and case analysis of *Teacher A and Teacher B* (modified from de Freitas & Zolkower, 2009)
    - a. Read lesson transcripts and then respond to prompts (see Appendix E)
    - b. Read interviews and respond to next set of prompts
    - c. How are the teachers positioned? What may be influencing how they are understanding their students or their teaching?
  - 3. Before the next session
    - a. Writing prompts: 1) During this week, similar to what we did today, take time to reflect on *two* different scenarios and map the relationship between the discourse that you see, the teacher(s), and the student and any other possible actors or elements (such as mentor teacher(s), you, intern(s), administration, etc, if applicable).
- D. Follow-up after session
  - 1. Review PSTs' mapping and postings
  - 2. Content-log all videos

3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
4. Plan homework handout for Session 4.

#### **Session 4: Teaching as situated in contexts**

- A. Objectives: C and D
- B. Materials
  1. Handouts
    - a. Writing prompts
  2. Large poster paper and markers
  3. Audio and video recorders
- C. Session Outline
  1. Examine artifacts as evidence of teaching, first at the concrete level, then as evidence of practice, and then as created and situated within contexts.
    - a. Think about what you were planning. What were your expectations? What did you anticipate? What were your intentions? What did the students do? How did you respond? Be specific as possible.
    - b. What were the different discourses that were informing this episode of teaching? In what ways? What constraints did you feel? How are the students positioning you? How are you positioning the students?
  2. Before the next session
    - a. Writing prompts: 1) Reflect on our work so far. This is a chance for me to know more about how I can think about our time together. Some questions to guide you: Have these meetings helped you think about mathematics teaching or yourself as a mathematics teacher? If so, how? What have you learned so far about yourself as a mathematics teacher? What do you still want to learn? What do you have questions about? 2) Detailed written response on artifact of teaching.
- D. Follow-up after session
  1. Review PSTs' written reflection on artifacts and reflection on our seminar.
  2. Content-log all videos
  3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  4. Plan homework handout for Session 5.

#### **Session 5: Teachers in contexts**

- A. Objectives: C and D
- B. Materials
  1. Handouts
    - a. Mary Hurley narrative and video transcript (Appendix F and G)
    - b. Writing prompts

2. Copy of Mary Hurley video
  3. Large poster paper and markers
  4. Audio and video recorders
- C. Session Outline
1. Case analysis of *Mary Hurley* (Carnegie Foundation for the Advancement of Teaching, 2006)
    - a. Watch video and discuss
    - b. Mary Hurley mentions many different discourses that are framing her teaching. What discourses and positionings are present? What discourses is she negotiating? In what ways?
    - c. How is she positioning herself and how is she positioned? How does she reposition herself? For example, how is Mary positioned by the pacing guide? How does she reposition herself?
    - d. Grounding your thinking in one of the discourses from her narrative, how would this discourse explain and treat a student, especially his or her performance in class? How would teachers or peers operate within this discourse? What are the implications of this discourse for our teaching practice? What would you do differently? From the written reflection, what are the different expectations of the teacher for her students?
    - e. How does this resonate with your own classroom? What do you think that she could do differently? What do you think that you could do differently in order to negotiate these discourses? What would that look like exactly?
    - f. How do you think that Mary thinks of herself as a teacher? How are discourses and her positioning framing how Mary thinks about herself as a teacher? This should help them with their position statements. In their positioning statements, they got stuck on immediate positionings and not how prevailing discourses are positioning them.
    - g. What would you expect to see in her classroom? What do you think that this would look like when teaching mathematics?
  2. Before the next session
    - a. Writing prompts: Revisit your response (after Session 2) about how you are positioned and how you position yourself as a math teacher or in your math classroom. Thinking about our recent conversations and discussions, your artifacts, the transcripts and reflections from other teachers, and your mappings, add to and revise what you wrote, adding new positionings or discourses that frame your teaching, as necessary. Then, reflect on your revisions. That is, think about why you are making these changes and/or what made you think about your positioning differently.
- D. Follow-up after session
1. Review PSTs' written reflection positioning
  2. Content-log all videos

3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
4. Plan homework handout for Session 6.

### **Session 6: Students in context and problematizing teaching**

- A. Objectives: B, C and D
- B. Materials
  1. Handouts
    - a. Writing prompts
  2. Electronic copy of the Wire, Episode 7 (see Appendix H)
  3. Large poster paper and markers
  4. Audio and video recorders
- C. Session Outline
  1. Viewing of *The Wire* episode and whole group discussion
    - a. What is the show saying about kids? Kids as students?
    - b. What is the show saying about teachers?
    - c. What is the show saying about math teaching?
    - d. In these scenarios, does it matter that this is a classroom full of poor African-American students?
    - e. Specific to the show: How is Prez positioned? How are the students positioned? In what ways is Prez repositioning himself and/or the students? Are there other possibilities? Are there other things that could be happening? Are there other ways that we could explain it?
  2. Before next session
    - a. Writing prompt: 1) We've been focusing a lot on *your* positioning both as a teacher and an intern. What we've seen today is how both students and teachers are embedded in layers of context and discourses. Think about your own experience, you as a teacher, and the students that you work with. Are there other discourses and positions that we have not mentioned that you feel position your students in different ways or that students use to position themselves? How? Where do you see these in your classroom or in your lessons?
- D. Follow-up after session
  1. Review PSTs' written reflection on *The Wire*
  2. Content-log all videos
  3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  4. Plan homework handout for Session 7.

### **Session 7: Reauthoring**

- A. Objectives: B, C and D
- B. Materials
  1. Handouts

- a. Writing prompts
- 2. Large poster paper and markers
- 3. Audio and video recorders
- C. Session Outline
  - 1. Discussion of narrative assignment for portfolio
  - 2. Small group discussions of individual narratives and framing themes.  
Focus PSTs on their artifacts from teaching and their teaching contexts.
  - 3. Before next session
    - a. Writing prompt: 1) Revisit your math autobiography and “good math teaching” ideas. During math methods, you added comments to your original ideas about good math teaching that you wrote in September. Now, go back to the one that you wrote in December and add to, revise, and make comments on both the autobiography part and the second part about good math teaching. Use track changes when you add new text and also highlight specific parts and make comments. Then, reflect on your revisions; that is, think about why you are making these changes and/or what made you think about your positioning differently.
- D. Follow-up after session
  - 1. Review PSTs’ written reflections on their mathematics autobiography
  - 2. Content-log all videos
  - 3. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  - 4. Begin identifying video segments for simulated recall interviews.

### **Session 8: Revisiting**

- A. Objectives: B, C and D
- B. Materials
  - 1. Handouts
    - a. Writing prompts
  - 2. Large poster paper and markers
  - 3. Audio and video recorders
- C. Session Outline
  - 1. Discussion of vision statements
  - 2. Individual and small group work on narratives
- D. Follow-up after session
  - 1. Content-log all videos
  - 2. Use videos and writings to plan for next sessions. Review objectives and goals, how session met objectives, and how objectives relate to goals.
  - 3. Plan interviews with PSTs.

## Appendix C

### Algebra for All

PSTs read and discussed the following vignette in Session 1.

#### Case 1: Algebra for All?

*As you are reading the following case, think about the following: How is mathematics seen by Tara, by Mr. Wilson, by the district or by others?*

For years Orange Valley Middle School has been regarded as the city's equivalent of a private, elite school. It boasted of its high test scores, its rigorous curriculum, and the fact that it was a feeder school into the city's prominent high school that served primarily the White children of doctors, lawyers and professors of the local university. Orange Valley's students had come from middle class home, some of modest wealth. Until recently, the school had served a predominantly White student population. Even today, its teaching staff comprises mostly White teachers.

In recent years, the community has undergone what old timers in the neighborhood and veteran teachers perceive as rapid demographic changes. In reality, the changes were more gradual. Elderly members began moving into retirement communities and many families began to "move up," buying into more expensive neighborhoods. As these families moved out, working- and middle class African American and Latinos and some White first-time buyers moved into the neighborhood. At the same time, the school district instituted boundary changes to accommodate enrollment increases in other parts of the city. The new boundary included Latinos from poorer parts of town. As a result, Orange Valley saw an increase in the number of students who are African American and Spanish-speaking immigrants.

Orange Valley teachers expressed concern about these changes as they saw a drop in achievement scores. While the achievement scores were far from abysmal, the teachers viewed the decline as a sign of impending doom. Orange Valley's stellar reputation began to wane. Even though White students were 60 percent of the school's population, some community members and school professionals began calling Orange Valley the "minority" school. What seemed to complicate matters for teachers was the recent onslaught of legislative mandates. These mandates called for class-size reduction, new promotion standards and required mandatory testing and accountability systems for districts and teachers; they also called for an end to bilingual education. The mandates produced a flurry of district policies from which the teachers were reeling. On top of everything else, the state insisted that all eighth graders take Algebra 1.

Mr. Wilson was particularly agitated by all of this. He'd been teaching for thirty years and taught honors mathematics for 8<sup>th</sup> graders, an Algebra 1 course. Since he was the chairperson of the mathematics department, he was responsible for developing a proposal addressing how the department was going to ensure that all eighth-grade students met the algebra requirement. He called a meeting and instructed Tara, who was interning in his classroom, to be there. As she was leaving for the day, Mr. Wilson said,

“This meeting will give you a first hand look at how education is going to hell in a hand basket.”

Tara arrived promptly at the meeting, soon joined by eight other 6<sup>th</sup>-, 7<sup>th</sup>- and 8<sup>th</sup>-grade math teachers. Despite Mr. Wilson’s cryptic comment from the previous meeting, she anticipated a discussion on how best to restructure the curriculum so Orange Valley students could be ready for algebra by 8<sup>th</sup> grade. Instead, she witnessed something altogether different. Mr. Wilson began speaking. “As you know, we will have to start teaching all eighth graders Algebra 1. I think this is a crock! How in the world can you teach all students algebra?” Other teachers chimed in. One of the 6<sup>th</sup>-grade teachers complained that many of her students didn’t know their basic math facts. Another concurred, adding that she had students who couldn’t even speak English.

Mrs. Johnson taught 8<sup>th</sup>-grade mathematics, but she had a different opinion.

I have had some students who didn’t know their math facts but they exceeded my expectations in problem solving and working through problems that we wouldn’t expect them to do. Isn’t it our job to prepare students for any path that they want to take in high school?

However, several teachers wanted to know that if students don’t know their basic facts and can’t speak English, then how could they be taught Algebra 1? The discussion continued.

Mr. Jones taught 7<sup>th</sup>-grade mathematics. Like most of the teachers in the room, Tara found him pleasant and genuinely concerned about his students’ needs. Usually, he wasn’t one to speak during meeting:

I have trouble with what the state wants us to do. I think it will be very harmful. Not all kids are capable of learning algebra, just the lower level skills. It’s harmful to their self-esteem to force algebra on them. Take Rojelio, for example. He’s a kid in my class, very average. This kid probably isn’t going to college. It’s unfair to make him take Algebra 1. He’s never going to use it.

Many teachers seemed to nod their heads in agreement with Mr. Jones. They raised issues of self-esteem, increasing the drop-out rate, and the drain on school recourses as the negative outcomes to implementing the state’s new requirement. Without any discussion on a new curriculum proposal, Mr. Wilson concluded the meeting saying, “At the rate we’re going, the only thing we’ll be able to offer here is remedial math.” There was some mumbling from other teachers, seemingly in agreement, as they made their way out the door.

Tara listened to the entire discussion without comment. She was both taken back and fascinated by what the teachers said. She tried to make sense of the teacher’s reactions and the complex issue of offering Algebra 1 to all students. Even though some of these issues about students, teaching and mathematics had been brought up in her university courses, she realized that she had no practical experience dealing with them. Tara began the meeting thinking that it was a good idea to teach Algebra 1 to all 8<sup>th</sup>-grade students, but now she felt that the issue was much more complex and she wasn’t sure.

Modified from: Crockett, M. D. (2008). *Mathematics and teaching: Reflective teaching and the social conditions of schooling*. New York: Routledge.



## Appendix D

### Angela, Benjamin, and Mrs. Carlton

PSTs read and discussed the following vignette in Session 2.

#### Case 2: Angela, Benjamin, and Mrs. Carlton

As soon as the dismissal bell rang, Benjamin Sykes, an energetic little boy, darted for the door, backpack in tow, nearly taking out Maya who sat near the door. Mrs. Carlton sighed. She knew that Benjamin's action warranted a reprimand, but it was Friday. She was exhausted and ready to go home. From the moment he walked into her 3<sup>rd</sup>-grade classroom, Mrs. Carlton knew he was trouble. It seemed that he couldn't sit still for more than two minutes, and she often placed him in "time out" for being out of his seat. It bothered Mrs. Carlton that his 2<sup>nd</sup>-grade teacher had not referred him for special education services. Now, she was stuck trying to work him. This was particularly frustrating, since considerable district pressure was being placed on the teachers to raise test scores. Mrs. Carlton loved her students and teaching, but the district pressures and her feelings of frustration were becoming hard to manage. Thank goodness for Angela, Mrs. Carlton thought to herself as the last of the students left.

Angela had been interning in Mrs. Carlton's class for the past three weeks. It was the first semester of her student teaching internship. For two hours each morning, she observed the teacher's instruction and management strategies, and she assisted students with their work. For her mathematics methods course at the university, Angela was currently working on a case study focused on the math experiences of one student, and she decided to focus on Benjamin. The case study involved gathering information about the student's math achievement at school, as well as the mathematics the student encounters in the lunch room, on the playground and at home. The professor suggested that the interns spend an evening at the student's home interviewing parents and siblings and shadowing the student. Initially, Angela worried about getting permission to go into a child's home, but Benjamin's mom was especially agreeable once she found out that Angela was the "new teacher" at school, the one who had been tutoring her son.

Angela had become accustomed to the complaints Mrs. Carlton aired during morning recess. At first, Mrs. Carlton's complaints seemed reasonable. Angela could see that some of the children were often off task, not following directions, or not completing assignments. Some were even rude, yelling out answers and talking out of turn. Yes, Angela agreed, that this was inappropriate behavior. How could one teach under such circumstances? Little by little, however, Angela began to recognize that Mrs. Carlton's management skills left something to be desired. She contributed to the bad behavior that left her exasperated. Angela observed a math lesson on multi-digit addition with regrouping. As Mrs. Carlton explained step-by-step how to add the digits, few of the students seemed to pay attention. Two students were poking each other with pencils, another secretly or so she thought, played with her Barbie doll, while several others stared out the window as a custodial crew painted white lines on the playground's black top. Mrs. Carlton continued as though unaware of the students' lack of attentiveness. It wasn't until she assigned them problems from the textbook that chaos ensued. Some students didn't have their books, and many complained that they didn't understand the

word problems. “Weren’t any of you listening?” she shouted. “This stuff is easy. Just go step-by-step starting in the ones place. You can do the word problems if you just read them!” Mrs. Carlton was more than agitated.

Mrs. Carlton frequently complained about parents. “These parents aren’t like the ones we used to have. If they would discipline their children and see to it that their children did their homework every evening my job would be a lot easier. I’m not trying to be insensitive, but these parents don’t care.” Angela knew what Mrs. Carlton meant by “these parents”. It was likely that Mrs. Carlton and other teachers in the school weren’t used to having Black children in their classrooms. Mrs. Carlton had been teaching here for 14 years, and in recent years, professional and working-class parents fleeing the pressures of urban life moved to the fast-growing suburban community where housing was more affordable. For the first time, the community saw an increase in its Black residents. Nevertheless, Angela was growing weary of Mrs. Carlton’s constant indictments of the children and their parents. Many of them flew in the face of her classroom experiences and knowledge of the children’s backgrounds. Because of the case study she was developing about Benjamin, Angela wondered if Mrs. Carlton knew about the lives of the students she taught.

For example, Mrs. Carlton insisted that Benjamin was a low achiever. She seemed to think he didn’t know his basic facts. When Angela examined his cumulative file, his test scores from 2<sup>nd</sup> grade indicated that he was above grade level. In fact, the grade equivalent score was 6.2 and 4.8 for mathematics basic skills and problem solving, respectively. This information was consistent with her tutoring experiences with Benjamin. He resisted doing the daily math assignments, but with her urgings, he always successfully completed them. He knew his basic facts like the back of his hand. His resistance, Angela speculated, was because he found it boring to do 20 computation problems a day. On two occasions, Angela observed Benjamin on the playground. Basketball seemed to be his game. When Angela talked to him about it, she marveled at the numerical data he kept in his head. He knew the scores of each team for every day that week, how many points each team member made, how many fouls were committed and by whom. He talked about how was the best free throw shooter and who make the best lay ups. Angela spent her first evening with Benjamin’s family several days ago. It was laundry night. Angela followed Benjamin and his mom into the basement of their apartment building. She watched Benjamin count out 12 quarters for three loads of laundry. As his mothers loaded the clothes into the washer, Benjamin carefully poured liquid detergent into a measuring cup. Angela asked, “How much are you pouring in?” “One fourth cup,” he replied, putting the cup close to his face before pouring it over the clothes in the wash.

Angela was fascinated by Benjamin’s family life. She was pleased when Mrs. Sykes agreed to a second visit. Mrs. Sykes was a single parent, but from what Angela could tell, Benjamin’s home life was reasonably stable. He had an after school routine that included homework and chores. Once a week he helped his mother do laundry. Her growing knowledge about Benjamin and his family caused her considerable concern. Benjamin demonstrated mathematical competence in tutoring sessions, on the playground, and at home. Why was he not engaged in Mrs. Carlton’s math lessons? Why did Mrs. Carlton insist that he had limited capacity to learn? She threatened to refer him

for special education services. Based on his school records and her observations, she could not see how Mrs. Carlton could justify such a referral. Angela wondered what she should do.

What do you think that Angela should do?

Modified from: Crockett, M. D. (2008). *Mathematics and teaching: Reflective teaching and the social conditions of schooling*. New York: Routledge.

## Appendix E

### Teacher A and Teacher B

The following activity was used in Session 3. PSTs read and discussed the transcripts and related questions before they were given the interview transcripts or follow-up questions.

#### Positionings, Students and Teachers: Part 1

Below are two transcripts (Atweh et al. 1998; task from de Freitas & Zolkower, 2009) documenting teacher discourse in two different classrooms, the classrooms of Teacher A and Teacher B. In each case, the teacher, T, is introducing the concept of function. As you read the two transcripts, look for evidence to help you answer the following questions:

1. How does the teacher introduce the concept?
2. How are the definitions of terms given? Explicitly, directly or indirectly?
3. Does the teacher use the formal language of mathematics?
4. Are the students invited to make decisions about their learning? If so, in what ways?
5. How is authority distributed across the student, teacher, and content?

Teacher A

T: Right. Okay [He then writes on the blackboard:

*Domain: numbers where we get the  $x$  (independent variable)*

*Range: numbers where we get the  $y$  (dependent variable)]*

T: Then we end up with set of ordered pairs. [Writes on the blackboard:  $(x, y)$ ]

T: Ordered pairs  $x, y$

T: A set of ordered pairs is a function if for a value of  $x$ , there is one and only one value of  $y$ .

T: It is important to say “one and only one”. We cannot have a zero [sic]. There must be a value. For every  $x$ , there must be a value of  $y$ , and there must be only one value of  $y$ .

Teacher B

T: What we are going to look at is dealing with graphing names  $x$  and  $y$ , something found in textbooks—words to remember domain, co-domain, [and] range. We are going to look at those words and other words such as relation and function. Not very important that you know those words, but what they actually do will be the important thing. As this one suggests, relations—we all have relations of some sort, so it’s “getting together” or some sort of arrangement. We will have to look at those things there. When we have a graph, something like that. [Draws a simple line graph]

T: For every value of  $x$ , there will only be one value of  $y$ . So we have a special relationship between  $x$  and  $y$ . Sometimes, unfortunately, though, we come across things like that one, that particular graph there. [Points to a drawing of a parabola.]

T: You will do these next year in Year 10 [sophomore year of high school]; they will

have special names like parabola. Now in the case, there, you know, for every  $x$ -value, there could be different [values] for  $x$  but the same value for  $y$ . If we drew a little line across there. [Points to where a line could cut across the parabola]

T: You notice that the graph there has the same  $y$ -value but has different  $x$ -values. And that's what we are going to have a look at today.

## Positionings, Students and Teachers: Part 2

The following are two excerpts below taken from interviews with Teacher A and Teacher B:

Teacher A

T: These kids are going to be mathematicians in the sense that they are going to be able to construct models and draw inferences from them whether it be in business or in a scientific field. That is basically where we have to head with our mathematicians.

Teacher B

T: They have an idea 'I'm never going to need math in the future because all I want to do is selling or be a check-out girl.' That is fair enough, but they don't realize that math is important to them making sure that they're not cheating the customer or, if they are the customer, they're not cheated.

Consider the following questions:

6. What do you notice about the teacher's attitude toward the students?
7. In what ways are the students positioned by the teacher? OR, the students are positioned as what or by what discourse?
8. Specifically, how do you see the students' positioning in what the teachers say?
9. How do the teachers' reflections on their students trouble your original reading of the classroom transcript?
10. Now, look back to the previous transcripts. Where do you see the teacher's attitude or expectations in the previous transcripts?
11. What are the implications of the teacher's positioning of the students?

Transcripts from Atweh, B., Bleicher, R. E., & Cooper, T. J. (1998). The construction of the social context of mathematics classrooms: A sociolinguistic analysis. *Journal for Research in Mathematics Education*, 29(1), 63–82.

Modified from de Freitas, E., & Zolkower, B. (2009). Using social semiotics to prepare mathematics teachers to teach for social justice. *Journal of Mathematics Teacher Education*, 12(3), 187-2003.

### **Positionings, Students and Teachers: Part 3**

In Part 1 and Part 2, we talked about how the teacher positions the students. Now review the transcripts of the lesson and the interview and think about how the teacher may be positioned or is positioning his- or herself.

Use the following questions to guide you:

1. What discourses about schooling, mathematics or learners may be positioning the teacher or influencing the teacher's beliefs?
2. What discourses may be influencing how the teacher is teaching?
3. What are the implications of how the teacher is positioned?
4. What could the teacher do differently? That is, what are opportunities that the teacher could take up to subvert these discourses?
5. What could you do differently? What discourses or positionings would you be subverting with that change?

## Appendix F

### Mary Hurley Narrative: Transcript from Video

PSTs listened to Mary Hurley's narrative about her teaching. Below is the transcript from the video (Carnegie Foundation for the Advancement of Teaching, 2006)

"In the math curriculum that I have to work with because I work in Oakland, I have a particular text that I have to use, then I also have a pacing guide that tells me that day 1, page 1, day 2, page 2. And this pacing guide is the same for entire district. And each year, no matter who the students are, same tests, same pacing guide. The reason the pacing guide is so onerous, is that the district test the students based on the pacing guide, every 6 weeks, and the result of that test are posted in the school. So not only am I aware of whether I'm behind, and my site administrator and so is the district and so is the entire community.

"So the pacing guide becomes this point of conversation among all teachers. When we get together and talk, we're not talking about the best strategies so that kids really understand long division or that um, how are we, what strategies are we using to effectively teach fractions, decimals or percents. We're discussing where are we on the pacing guide. Because that's the assessment piece, the only assessment piece that counts. Given that what do I do, in a normal classroom setting, where I've got kids of differing abilities, kids for whom the pacing guide is perfectly fine, that's the rate at which their acquiring knowledge, and for other kids, it's way too fast. It's like whirlwind. And for other children, they're sitting their twiddling their thumbs because the pacing guide is much too laborious and slow, you know. So my question is, given the givens, um, how do I go into that curriculum and revise it on a daily, hourly and minute-by-minute basis to meet the needs of the real kids who are in front of me. Um, and at the same time, not completely fall apart, so our school or our classroom becomes a point of contention in the district, that the kids in this classroom are not meeting their benchmark scores in math.

"So, it's a tricky edge to walk on of making sure somehow I get through that pacing guide and also that I have some personal integrity as a teacher in meeting the needs on my students. So what decisions do I make about what I give up and keep in the curriculum? How do I, I also have a four-five combination so I also have to manage two sets of assessments, and two curriculums and two textbooks simultaneously. How do I hit all of those pieces in a manageable way and in a humane way for the kids and for myself? So I am going in and revising the givens, still within the [??], and I don't have an answer for that. I try with different strategies that I try, and when I look back, I, um think that I did do my own assessment so to see if my, where I am with the kids on the, I also have informal assessments, I'm sure every teacher, looking at kids daily work, as well as strategy sessions and alternative teaching sessions, ways to augment the curriculum for kids who [??]. So I think that it's this piece around revising a lockstep curriculum to make it work for my students and myself."



## Appendix G

### Mary Hurley Written Narrative (Handout)

Carnegie Foundation for the Advancement of Teaching (2006)



#### Negotiating the Fifth Grade Math Curriculum: Compliance and Revision

Mary Hurley , Redwood Heights Elementary School  
Oakland, California

### Content

**District Mathematics Curriculum:** The Oakland Unified School District uses Harcourt Mathematics throughout the K-5 grade levels. Mary Hurley is responsible for implementing both the fourth and fifth grade programs. The curriculum is regulated by a pacing guide developed by the district office of Curriculum and Development. Teachers must conform to the pacing guide. District benchmark assessments corresponding to the pacing guide are given every six weeks. Each school is required to post the results of these assessments in their lobby.

**Hurley's Math Instruction:** Although her math teaching is guided by the district curriculum, Hurley states that there are two central pieces to the mathematics teaching and learning that goes on in her classroom. One part is content as compiled in the fourth and fifth grade curriculum materials. The other is focused explicitly on learning. She aims to teach students both to think and to work as a community. She includes herself among the learners as well: "There's a lot of teacher learning going on. There is math learning for fourth and fifth grade kids, learning how to think and work productively as a community in small and large groups, and also teacher learning. I'm really working it as a teacher."

### Teaching the Curriculum

Mary Hurley stresses that in addition to covering the math curriculum, a priority in her teaching is to support the students' ability to express what they think. She points out, "Sometimes the hardest work I do in the class is to really hone in on what I'm hearing - what it is that they're really saying that captures their math thinking. Then taking that to the next step, I have to think hard about what is going to be a really deep but compassionate question that is going to move them further and at the same time open it up to another group of kids who possibly didn't understand it. Listening is intense because you don't know what is going to happen next. And of course, I make all kinds of assumptions about what I think they understand that they may not." She also adds that moving through the curriculum is but a frame for the intense teaching and learning that takes place in the classroom. Listening intently, responding deeply, working

collaboratively, and talking together about concepts and strategies are all integral parts of the math in her classroom.

**Revision.** Mary Hurley was concerned that the way her class was structured in prior years was neither meeting her needs nor the needs of her students. Few were enjoying math or pursuing deeper mathematical questions. Students were also progressing at different rates. She implemented math groups to better negotiate the pacing guide, district benchmark assessments, standards, curriculum, and the priorities she identified as a teacher. Inspired by a team-based middle school mathematics curriculum with which she had previous experience (CPM), she decided to try a more collaborative approach. With 33 students, she felt having them work together might provide support in various ways that she was not able to provide to them individually. Realizing there was nothing explicit in the curriculum or the pacing guide to prevent her from using a more collaborative approach, she restructured her math time to include groups for the students' work in math.

Mary Hurley's concept of revision holds within it both reflection and learning: "I can't emphasize enough the whole idea of looking closely at your practice. Whether it's through some kind of teacher research group or a journal or with colleagues - every single time I have the opportunity to look closely at what I'm going my teaching always improves. By improvement, among other things, I mean my students actually doing better on outside assessments. Sometimes I go through periods of confusion and self doubt. By a reflective cycle or by a process of looking closely and deeply, I feel better about my work. Look closely. Look closely with someone. Talk about it. It's going to get better."

**Pacing Guide.** "The pacing guide is such a deadly thing for new teachers because it appears to be answering their dilemmas of 'Just tell me what to do. There's so much, just tell me what I do, then I'll be a good teacher.' And the pacing guide erroneously sets up the belief that if you do this on this day, and this on this day, you'll be a good teacher. But it doesn't work that way. So I think it's a false path to start particularly new teachers down. With it, constructing their own knowledge is a challenge. How do they construct their own understanding of how their kids are learning and how it's connected to what they're presenting if they're just checking off the day's requirement? It's not connected. Yet the pacing guide is coming from a really well intentioned place of giving teachers some guidance. There are some 2000 pages to read if the teacher reads the whole curriculum. How do you choose? The pacing guide regulates that. It's intended to help teachers out, particularly teachers with little experience. And in districts where there is high student mobility, if they're moving around they won't miss a day of instruction. Of course just because they won't miss a day of instruction doesn't mean they're learning anything, or that a teacher understands what's going on. It's sad because the only conversation that goes on in the teachers' room is not: 'Gee, I'm really having a hard time getting across this idea of fractions or negative numbers.' Rather it's: 'Where are you on the pacing guide?' And the answer's almost always 'I'm behind.' This is discouraging, though it can be a good thing if it prompts teachers to ask what they can do about it, what action can be taken."

## Teaching Approach

Mary Hurley's approach to teaching has her own learning at its core. "I try to figure out what works. My approach is to spend a chunk of time sorting out what I think is important and having that as my set of goals. Then I need to figure out what works given the context I'm in, meaning mostly who the kids are that I'm working with this year. Additionally, figuring out what are the constraints the district is imposing on my principal this year, then me as a teacher is an important part of it. So it's pretty pragmatic."

**Example--Math Groups:** An example Hurley cites of the embodiment of her practice is the development of math groups: "The math groups came out of a previous semester, and really a previous year, of not being really comfortable with just small little revisions to try to get through the combination of the pacing guide, district benchmark assessments, state standards, a curriculum and what I know about math already from my own experience and understanding and study. So being uncomfortable with how I had structured the classroom to work propelled me, seeing that it really wasn't meeting my needs as a teacher and kids weren't really enjoying math. And if they weren't enjoying math that meant that they didn't really pursue deeper questions. I felt that we were just getting through it. That's not enough. I realized it wasn't enough to make it work for this set of kids or that set of kids, or revising this or that—doing my warm-up differently. It was going to have to be something bigger than that. As always, I had to acknowledge that this was going to be something I wasn't sure was going to work. It was going to be a big shift. So that's when I started thinking in the past in different circumstances—and this is where I think some of it takes a depth of teaching where you've got a lot of different experiences—what in the past could I bring to this current set of pacing guide, standards, benchmark tests. The math groups I had used that particular structure in a very different setting (middle school math program a couple years ago) using the CPM program and thinking about the kind of learning community it built. I remember thinking there's nothing inherent in what I've got to get these kids through this year that would exclude doing it in math groups. So I thought I'd see if it would work. That's how that change in the structure of math time came about. I realized it needed to be a more generative period of the day where kids are generating questions, where they're feeling good about the work and I'm feeling good about the work. Because otherwise, I was dying on the vine and the kids were dying on the vine."

Hurley continues, "Of course, any revision has got to have as a measure the kids doing better. But then you ask what is the measure of kids doing better. Benchmark scores to me are more valid than other kinds of testing because they come more frequently and are based on the material that you covered. If I was going to use that resource--because we had to do the six week assessments--I realized I had to reign myself in and follow the sequence on the pacing guide. My tendency is more to look at how math ideas develop in the classroom and to build on those capacities. For example, teaching fractions, decimals and percents as a whole idea—as being parts of wholes and that they're all related makes sense to me as a teacher and when I've done it before seems to make sense to the kids. But, in the benchmark assessments fractions are assessed in one benchmark test, decimals are in another, percents are in another. So I don't get to teach it as a whole package the way I like. I was willing to let go of that and let the math groups satisfy me and satisfy the kids. BUT, they had to score well on the benchmark. It was also listening to kids that

first semester and seeing that when you have kids ranging in age from 8-12, and you're covering two curricula, 4th and 5th grade, that kids are really going to have to be more self-reliant as math students and understand themselves as learners, rather than relying on the teacher to get through it no matter how brilliant the lesson. So math groups—math groups and math partners—lent themselves really well to that pretty complex situation. Based on what we found out from interviewing the kids, it didn't appear to make any difference whether it was the kids who found the math curriculum really challenging and who were struggling, or the kids who breezed through it. The math groups seemed to satisfy something intrinsic about themselves as learners across the board."

## Appendix H

### The Wire, Season 4, Episode 7 (Zorzi & Hemingway, 2006)

PSTs watched clips from Episode 7 that dealt with the school context and students and teachers in the mathematics classroom. Transcript from the selected clips is below.

Mr. Prez: You know I said you can't be gambling.

Student 1: Yo, Mr. Prezbo, the quarters are only, you know, a reminder. You know that I got 25 shells.

Student 2: Dang, flush.

Student 1: But it don't beat your three 9's right?

Student 2: Yeah it do!

Student 1: It do?

Mr. Prez: It does. Kareem, you should have been more cautious with your bet. Figure the odds.

Student 2: Yo, it's our lunch break, don't be schooling us now.

Student 1: Wow, hold on let him talk.

Mr. Prez: First, you ahve to get a count on the diamonds. You know how many diamonds there are in the deck?

Student 1: 13

Mr. Prez: 13, that's right. Cards are all about knowing the numbers. The numbers you can calculate the odds. Now, Michael had 4 diamonds showing-

Student 1: Wait, what about dice. I mean, does dice have odds, too? Cause, that's what we play.

Mr. Prez: Dice, sure.

Student 1: So, can you show use the odds with dice.

Student 2: Yeah for real.

Man in office: I see you're undercover. Don't worry, I'll keep it close.

Prez: Does the school have any collection of board games? Parchessi, Trouble, Monopoly?

Mrs. Donnelly: You still teaching 8th grade math, right?

Prez: Trying to.

Mrs. Donnelly: The bookroom downstairs. Stay on the curriculum Mr. Prezboluski, or you'll have an area superintendent on our backs.

Prez: Just the dice. Grab the dice from any game that has 'em... We're using the 3rd edition, right?... If we're using the 3rd, what are the new 5th edition doing sitting down here in a box?

(opening computer) No way.

Assistant principle: Now she's saying sex was consensual with XX and XX only.

Prez: So, Randy?

Assistant principle He'll be back tomorrow.

Prez: The thing with the police?

Assistant principle: Out of my hands. Lose the gum.

Prez: Okay, settle down.

Student 3: Mr. Prezbo, where'd you go getting a computer?

Prez: We're having a computer in the classroom for a special project. And another thing-

Student 4: They're all new and shit.

Prez: Leave the old ones on your desk. And put your names in the box on the inside cover of the new ones. Okay, anyone have any trouble with the homework? Sharlene?

Sharlene: I didn't get it.

Prez: Didn't get what?

Sharlene: None of it.

Prez: Michael?... That's great. Good job.... John is this your work because it looks like someone else's.

John: No, I do my work.

Prez: Okay, next time try to remember not to copy Quinesha's name... Alright did everyone get a new textbook? Well for now you can get them out of site. (Wahoo! rolling dice in hand)

Kids rolling dice.

Student 2: Okay I'll take that.

Student 5: Pay up suckers.

Prez: Randy, what are you doing? Didn't we go over this? How many ways are there to make a four?

Student 6 : Not enough for his black ass.

Student 1: Yo, he just came today, so he missed the whole thing about the odds.

Prez: Randy, there are only 3 ways to a make a four, but to make a seven-

Student 6: 6

Prez: That's good. So, what should have been your play.

Randy: I should have bet against Jamal.

Prez: Good to have you back Mr. Wagstaff

(music playing, Student 3 sitting back by computer)

Prez (to English teacher): Trick 'em into thinking they aren't learning and they do.

## Appendix I

### Assignment: Reflections on mathematics learning and teaching

#### Due: Noon the day before Session 1

**Purpose:** This assignment has two purposes. (1) To closely examine your experiences as a math learner and reflect upon how those experiences have shaped your understandings of what mathematics is and how it is learned; and (2) To reflect on your beliefs about mathematics teaching and what it should look like.

**Why this is worthy of your attention:** One of the primary goals of this course is to give you opportunities to think about the nature of mathematics and what that means for learning and teaching mathematics. As in all kinds of learning, your learning in *this* course is built from your previous knowledge of and experiences relating to mathematics, learning and teaching. Thus, it is important to begin by digging into what it is you understand and believe about mathematics and how it is taught and learned. In addition, critically examining your own experiences as a learner of mathematics can help you better understand how your students hear, respond and understand their mathematical classroom experiences.

**Description:** We are hoping to learn a lot about you and your relationship to mathematics from this memo, so it should be illustrated with stories and examples from your experiences that are richly described. Your reflections should be grounded in those experiences. This memo has two parts. Each part should be no longer than 3 single-spaced pages.

#### *Part I: Reflections on your experiences as a math learner*

In this part, you will describe your experiences as a math learner and reflect on how those experiences as a learner have shaped your understandings of math, math teaching and math learning. In short, reflect on how your experiences shape what you think and know about math teaching and learning.

#### *Part II: Reflections on mathematics teaching*

In this part, you should describe what you think good math teaching looks like. Use examples and talk explicitly about what good math teaching involves—e.g., the goals and purposes of math teaching, what teachers and students do, the activities involved in math teaching, etc.

This assignment will be graded only for completion. The memo is due noon the day before Session 1. Send your memo to your instructor. You'll be sharing your thoughts on Part I in class during Session 1 (we'll return to Part II later in the semester).

## **Appendix J**

### **Assignment: Revisiting your reflections on teaching**

#### **Due: Session 11**

For this assignment, we'd like you to revisit Part II of the Reflection that you wrote at the beginning of the course. In this part of your original memo, you described what you thought good math teaching looks like. In this assignment, we want to know what has changed for you. Using the 'comments' feature of MSWord, note how your thoughts about mathematics teaching have changed. Link any new or changed ideas you have directly to what you previously said. At the end of the revised memo, reflect on your changes, providing any additional examples that you think will help us understand what you wrote.

This assignment will be graded only for completion. The memo is due at Session 11. Send your memo to your instructor by midnight the day before your session. In addition, you'll be sharing your assignment in class so please bring a hard copy to class.



## Appendix K

### Sample Interview Protocol

#### Laura

Introduction: The purpose of this is to learn about your thoughts about yourself as a teacher and your thoughts on our meetings, in an effort to inform both my research, future classes and teacher education at this level in general. Before we start, do you have any questions?

#### Understandings of self as mathematics teacher

1. Begin with her vision statement.
  - a. This is what you wrote back in March. Are there elements of your vision that may be challenging for you to realize? Any others? (Choose a few) Why? How do you think that you could overcome those difficulties?
  - b. Ask about her comments around “all kids are individuals and we need to know their strengths” vs “all kids can learn/do algebra/succeed”.
2. Tell me more about your placement and your mentor. What worked well for you? What did not?
3. Here is a particular clip from Session 1 (S1, 2<sup>nd</sup> clip, G1, 5:39). Play clip: “I imagine myself teaching a certain way, but I recognize in certain places I can’t do that”. Tell me more about what you were feeling then and what you are feeling now.
4. In your position statement, you talked about the structural aspects of your classroom and how they position you. Tell me more about that.
  - a. How do you feel about those elements looking back?
  - b. Can you describe a time this spring when you felt that there might be additional discourses shaping your teaching?
5. In your discourses statement, you talked a lot about the labeling and grouping of students.
  - a. How do you feel like you are now negotiating this?
6. Tell me about your mapping
  - a. How did you get here? Were there any specific conversations that supported you in thinking about this?
  - b. In what ways do you see this in your school?
7. Use autobiography:
  - a. What do you think that you’d change to this now?
  - b. What do you think led to these changes that you made to your ideas about math teaching? Anything else? Anything else?
  - c. Can you describe a time when our conversations about positioning influenced your thinking about yourself as a math teacher?
  - d. If you were to write your math autobiography now, are there other elements that you would add?
8. Tell me about your philosophy statement.

- a. Were there any specific conversations that supported you in thinking about this?
9. More in general, how have understandings of yourself as a math teacher changed? Can you describe a time when our conversations were significant to you in understanding yourself as a math teacher? In what ways were these conversations significant as you were working on your narrative?
10. Thinking back to our meetings, were there any conversations that were significant to you during our sessions? In what ways was that conversation significant?
11. The conversation in Session 3 felt significant to me.
  - a. Here was the transcript for Teachers A and B. If we were seeing this for the first time now, what would you think?
  - b. I'm going to show you a clip from a conversation during Session 3 that felt significant to me. I'd like you to tell me what you were thinking then, and what you are thinking now, both about what we were talking about and what you said.
  - c. Play clip (G2 2of2, start at 5:52) What do you see in his teaching now?
  - d. What do you think about the interview? What seems significant in the interview now?
  - e. 24:40. What do you mean that you see him not pushing back in the second part?
  - f. We had a conversation about what to say when a student talks about being a football player or being famous (Play clip 29:40). I'd like you to tell me what you were thinking then, and what you are thinking now, both about what we were talking about and what you said. What do you think that setting high expectations looks like?

### **Feedback on the seminar and activities**

12. If someone you're working with next year asked about this group, how would you describe it to them?
13. If you could choose to continue doing something like this group or aspects of this group as you begin teaching, would you? If yes, what would you like to continue? (i.e., specific activities, just having a group to talk about issues with, etc.)
14. Do you think that these sessions will be helpful to you when you are teaching next year? In years afterward? How?
15. What would you suggest be done differently in the future?
16. Do you think everyone in the cohort could have benefited from this? If so, how? If not, why not?
17. In what ways did working in this group relate to other parts of the program, such as Capstone, action research, methods courses, internship, etc.?
18. Anything that you want to add?

## Appendix L

### Data Analysis Exemplar: Discursive practices of Working Difference

In what follows, I describe these practices and how they emerge in Ellsworth and Miller (1996), Williams (1991), and Ellsworth and Miller's analysis of Williams (1991) in order to provide a context for my data analysis of the focal PSTs. Patricia Williams' (1991) *The alchemy of race and rights: Diary of a law professor* is an autobiographical piece where Williams writes from and about the intersections and boundaries of race, class, and gender and uses anecdotes and her analysis in her discussions of racism, rights, and the law. She states that her writing is different from other scholarship about law: "I use a model of inductive empiricism, borrowed from—and parodying—systems analysis, in order to enliven thought about complex social problems" (p. 7). I attend to these four discursive practices in Williams' (1991) account of a series of incidents around a shopping trip where she was barred from entering a Benetton clothing store. I support my analysis with Ellsworth and Miller's analysis of William's account of these incidents. Similar to my analysis of individual PSTs, I follow Williams' developing understanding of self—that is, how she is reflexive about her positioning— and how she takes up new understandings or repositions herself along the emergent theme race and racism.

***Positioning as contextualized.*** Williams (1991) begins her account of her experience with a particular employee at Benetton by first discussing New York City and the current context: "Buzzers are big in New York City. Favored particularly by smaller stores and boutiques, merchants throughout the city have installed them as screening devices to reduce the incidence of robbery" (p. 44). In this attention to the social and political context, Williams suggests that her positioning and the positioning of the

Benetton employee is contextualized and situated within both the political situation around the buzzer system and the publics' reaction:

While controversial enough at first, even civil-rights organizations backed down eventually in the face of arguments that the buzzer system is a “necessary evil, that it is a “mere inconvenience” in comparison to the risks of being murdered, that suffering discrimination is not as bad as being assaulted, and that in any event it is not all blacks who are barred, just “17-year-old black males wearing running shoes and hooded sweatshirts.” (p. 44)

Williams shares the historical and political context of New York City at this time, complete with above quotes from the New York Times, before presenting her experiences with a particular employee at Benetton. Specifically, she highlights that the information about New York, the buzzer system, and the current discourse for and against the buzzer system are important elements for her story, and she suggests that without these elements, the story is not the same. In this manner, she emphasizes the contextualized nature of positioning by race and racism, how contexts serve to create identities, and that context matters in defining positioning and identities.

***Positioning as relational.*** In her account of her experience at Benetton, Williams identifies positioning as relational when she specifies how she is positioned and can be positioned in different ways and by different actors:

The installation of these buzzers happened swiftly in New York; stores that had always had their doors wide open suddenly became exclusive or received people by appointment only. I discovered them and their meaning one Saturday in 1986. I was shopping in Soho and saw a in a store window a sweater that I wanted to

buy for my mother. I pressed my brown face to the window and my finger to the buzzer, seeking admittance. A narrow-eyed white teenager wearing running shoes and feasting on bubble gum glared out, evaluating me for signs that would pit me against the limits of his social understanding. After about five seconds, he mouthed, “We’re closed,” and blew a pink rubber at me. It was two Saturdays before Christmas, at one o’clock in the afternoon; there were several white people in the store who appeared to be shopping for things for *their* mothers. (pp. 44-45)

Williams notes how she is positioned as a Black woman, specifically “an undesirable black woman,” *by* the store clerk saw her “only as one who would take his money and therefore could not conceive that I was there to give him money” (p. 45). William’s emphasizes how certain aspects of identities, such as race or gender, how we see ourselves, and how others see us are markers of relational positions rather than essential qualities (Tetreault, 2004). Williams did not feel that she was positioned as a woman who wanted to buy a sweater for her mother, although this was how she was trying to position herself. In this analysis, her attention to how she was not positioned as equal and to how she was positioned by race suggests her understanding of positioning as relational. Throughout Williams (1991), Williams “moves through and is moved by multiple categories: Harvard educated law professor, African American, contract lawyer, woman, shopper with money to spend, daughter buying a sweater for her mother” (Ellsworth & Miller, 1996, p. 253). Williams calls her positioning “oxymoronic,” which attends to the existence of multiple identities and opportunities for multiple membership as related to other individuals and communities.

While her discursive moves relate to the contextual nature of positioning, this second discursive practice of working difference is about explicit attention to the multiplicity of positioning and the constant process of and opportunities for negotiating positioning and membership in different groups. Williams' discursive practices are important because in addition to seeing contexts as complex, she acknowledges how her positioning is in relation to other individuals and groups, and how membership is shifting. Identifying, specifying, and responding to positioning as relational means recognizing the fluid nature of the boundaries of self and the importance of the interactive elements of positioning.

*Positioning in performance.* As this incident at Benetton unfolds and Williams then works to publish an essay about her story, Williams identifies positioning in performance. In her essay, Williams uses her incident at Benetton to discuss how “the rhetoric of increased privatization, in response to racial issues, functions as the rationalizing agent of public unaccountability and, ultimately, irresponsibility” (p. 47). The editors of the law review, however, first reduce her “rushing, run-on-rage” (p. 47) to simple declarative sentences, then remove all references to Benetton, and, in the final page proofs, eliminate all references to her race because “it was against ‘editorial policy’ to permit descriptions of physiognomy” (p. 48). One editor wrote, “I realize that this was a very personal experience, but any reader will know what you must have looked like when standing at that window” (p. 48). Williams was outraged by this comment and identifies it as the editor's response to his positioning by a discourse of color blindness and how it would position the reader to act and make assumptions about Williams' race: “What was most interesting to me in this experience was how the blind application of

principles of neutrality, through the device of omission, acted either to make me look crazy or to make the reader participate in old habits of cultural bias” (p. 48).

Williams convinces the editors that including her race was essential to the story, but in her retelling, Williams uses the experience with the editors to present how individuals’ actions are in response to how they are positioned by particular discourses of race, color blindness, and neutrality. Here, Williams does not specify or respond their context, elements of the personal backgrounds of either editor, or the multiplicities of the editors’ identities; rather, she identifies how they *responded* to her and uses this to understand how they are positioned. That is, where Williams attended to the social and political contexts and the situation New York City in particular to understand how the teenage “buzzer boy” responded and how he is positioned, Williams uses the editors’ actions and their discussion of relevance, personal style, and personal experiences to suggest how they are positioned by prevailing discourses about color blindness as neutrality and what practices of responding to these discourses looks like in academia.

Williams identifies, specifies, and responds to positioning by issues of race and racism as contextual, as relational, and in performance. This analysis suggests that she is reflexive about her positioning; in my analysis of PSTs, these three discursive practices suggests how PSTs are reflexive about their positioning, that is, understanding themselves as mathematics teachers.

***Repositioning.*** Identifying, specifying, and responding to *repositioning* suggests how Williams’ understandings of herself in relation to her positioning by issues of race and racism shifts. Analytically, repositioning includes identifying and specifying how to reposition oneself, engaging in repositioning oneself, as well as recognizing the

*possibility* for repositioning. Williams (1991) is significant because she is explicit about presenting the intellectual, physical, emotional labor involved in working difference: “By showing the work, [Williams] provides resources for social and cultural production of identities and differences, and refuses passive reception of already defined information about herself and others, produced elsewhere” (Ellsworth & Miller, 1996, p. 259). In this series of incidents around her exclusion from Benetton, Williams recognizes the possibility for repositioning and specifies how to reposition herself.

Williams actively negotiates equality and neutrality and specifies how she uses race differently in her repositioning. Specifically, Williams emphasizes that there are differences between being positioned outside of Benetton as different and “undesirable” and embracing references to racial differences and racialized meanings when publishing the story:

In the Benetton’s context, it was precisely her appearance, and the racialized meanings that have been historically attached to it, that made the differences between being buzzed in or barred as undesirable. Even though adherence to neutrality is often determined by reference to an aesthetic uniformity, in which difference is simply omitted, Williams finally and with much effort convinces the editors that “mention of my race was central to the whole sense of the subsequent text” (Ellsworth & Miller, 1996, p. 254)

In this way, Williams identifies the actions that one has to take in the repositioning herself in relation to discourses of neutrality and how these actions are situated in context.



Williams also responds to her positioning a few days after the incident at Benetton, when she found herself still ruminating about the incident:

I typed up as much of the story as I have just told, made big poster of it, put a nice colorful border around it, and after Benetton's was truly closed, stuck it to their big sweater-filled window. I exercised my first amendment right to place my business with them right out in the street. (1991, p. 46)

Williams actively repositions herself, negotiating her membership and identities in other groups, particularly as a citizen with equal rights. Elaborating on her actions of repositioning, Ellsworth and Miller (1996) suggest how Williams

unfixes the identity that had been attached to her by the actions of the young man behind the buzzer; the racialized practices associated with using buzzers in the act of determining desirability; and the historical and social legacies that converged to create the fixed category of "black as undesirable and probable thief." (p. 253)

Williams continues to labor with her positioning, repositioning herself by presenting her story at a conference and negotiating with editors to publish the elements of herself of her story the got her excluded from Benetton in the first place. That is, in being reflexive about positioning or understandings positioning as contextualized, relational and as performance, Williams responds by repositioning herself. These actions—and in my analysis, also the identifying and specifying of the *possibilities* for repositioning—suggest repositioning or *shifting* understandings of self. Butler (1999) emphasizes both acts of subverting positioning and "thinking through the *possibility* of subverting and displacing" (p. 46) for "intervention and resignification" (p. 45) of identities or, in this analysis, shifting understandings of self as mathematics teacher.

# Appendix M

## Eastern County Report Card

**Tips for viewing the report card:** Look at the whole report card, not just the grades. Students are unique and progress through the Essential Curriculum of the   Public School System at their own pace. The skills become more difficult from one instructional level to the next. This report card is one means of communicating a student's progress. Parents are encouraged to maintain communication with the school staff throughout the year.

STUDENT John Doe YEAR Current GRADE 2 SCHOOL Any Elementary TEACHER Mrs. Smith

**THE   SCHOOL SYSTEM**  
**GRADES 1 AND 2 REPORT CARD**

**1 EVALUATION CODE:** Indicates performance at the student's instructional level

I - Independent  
W - With Assistance  
N - Not Yet Apparent

**2 EFFORT CODE:** Indicates level of effort demonstrated in each subject area and learning behavior

1 - Outstanding  
2 - Satisfactory  
3 - Needs Improvement

**3 INSTRUCTIONAL CODE:** Indicates the instructional level at which the student is working

A - Above Grade Level  
O - On Grade Level  
B - Below Grade Level

		4 REPORTING PERIOD				3 INSTRUCTIONAL LEVELS				REPORTING PERIOD			
		1	2	3	4					1	2	3	4
<b>LANGUAGE ARTS</b>													
Communicates ideas clearly when speaking						Reading (Word ID and Reading Comprehension)							
Identifies words effectively when reading						Mathematics							
Demonstrates reading comprehension													
Communicates ideas clearly when writing													
Meets expectation in spelling													
Meets expectation in capitalization/punctuation													
<b>MATHEMATICS</b>													
Meets expectation in learning basic facts										5 LEARNING BEHAVIORS			
Demonstrates an understanding of concepts										Recognizes rights of others with courtesy			
Applies problem solving strategies										Follows established rules			
Effort										Exercises self-control			
										Works cooperatively with others			
										Takes appropriate risks			
										Listens attentively			
										Responds appropriately to directions			
										Persists when thinking through problems			
										Works with accuracy and precision			
										Writes legibly			
										Completes classwork assignments			
										Completes homework on time			
<b>SCIENCE</b>													
Demonstrates knowledge and skills													
Effort													
<b>SOCIAL STUDIES</b>													
Demonstrates knowledge and skills													
Effort													
<b>HEALTH EDUCATION</b>													
Demonstrates knowledge and skills													
Effort													
<b>PHYSICAL EDUCATION</b>													
Demonstrates knowledge and skills													
Effort													
<b>MUSIC</b>													
Demonstrates knowledge and skills													
Effort													
<b>ART</b>													
Demonstrates knowledge and skills													
Effort													
<b>LIBRARY/MEDIA</b>													
Demonstrates knowledge and skills													
Effort													

**6 ATTENDANCE**

Days Absent \_\_\_\_\_

Days Present \_\_\_\_\_

Days Tardy \_\_\_\_\_

**7** Your student's placement will be Grade \_\_\_\_\_ for the school year \_\_\_\_\_

Principal \_\_\_\_\_

**REPORTING PERIOD**

1 2 3 4

Total

These sample grades indicate that the student is working below a second grade instructional level in reading **3**. He identifies words effectively with assistance. His reading comprehension is not yet apparent **1**. The student demonstrates outstanding effort in Language Arts. The sample grades indicate the student is performing on a second grade level in mathematics **3**. He is working independently when learning basic facts and, with assistance, understanding concepts and applying problem solving strategies. He demonstrates satisfactory effort in mathematics **2**.

- 1 EVALUATION CODE:**  
**I-Independent:** Student's performance consistently demonstrates understanding of skills and concepts with little or no support on most objectives taught this quarter.  
**W-With Assistance:** Student's performance consistently demonstrates understanding of skills and concepts with support on most objectives taught this quarter.  
**N-Not Yet Apparent:** Student's performance does not consistently demonstrate understanding of skills and concepts on most objectives taught this quarter.  
 Performance indicators are based on multiple assessments from the entire marking period. These include classroom participation, teacher observation, quizzes, tests, projects,   assessments, homework and classwork.
- 2 EFFORT:** Describes the student's level of task commitment, class participation, quality and quantity of work, and timely completion of class and homework assignments.  
 Effort Code rating scale indicates the student *meets or exceeds expectations*:  
 1-Outstanding - *consistently*  
 2-Satisfactory - *most of the time*  
 3-Needs Improvement - *inconsistently*
- 3 INSTRUCTIONAL CODE:**  
 Instructional levels are only for reading and mathematics and indicate student performance in relation to grade level expectations.
- 4 REPORTING PERIOD:** Stands independently; the fourth marking period is not cumulative.
- 5 LEARNING BEHAVIORS:** Evaluated using the effort code rating scale.
- 6 ATTENDANCE:** Determined by state regulations.
- 7 PLACEMENT BOX:** Completed only at the end of the school year.

## Appendix N

### Interview with Laura

In the interview with Laura, I asked her about her comment in Session 1 where she discussed how she felt that enacting her vision was not possible in certain school contexts, particularly test-driven schools. This interview took place July 16, 2010.

Jill: So, what do you think about that?

Laura: Yeah, I think, yeah, I definitely thought about that a lot through our meetings. Um. Because it's true that there is that tension. I think later, I think that Candice was also commenting on that.

Jill: Yeah, right before this, she says like I really want to—

Laura: I think like especially for her being like a really wanting to be like, from what I know, like, you know, working in like urban schools, well like just from what I've heard about the schools in Graverly. Like they joke that you have to have the mastery objective up on the wall.

Jill: Oh, yeah, they're not kidding

Laura: [laugh] Or how you, like we were all shocked when we heard somebody make a comment, and we didn't hear this until second semester, maybe it was in one of these, like you have to have a certain number of grades? Maybe it was in practicum that somebody made a comment like, "Yeah you have to have a certain number of grades every--"

Jill: Yeah, some schools are crazy than others—

Laura: But it's a county requirement though

Jill: Uh, huh

Laura: Like there has to be a grade in. And like I remember the first time I heard that I was like, "Are you kidding?" And like that kind of a thing I was like I couldn't work with those kind of regulations. Like, um, yeah so, it's that kind of thing but then I'm like look at you know the population they're serving are kids who really need great teachers. And that's hard. Because like when we talk about DC. Like DC is in a weird place now, but generally looking in DC, I think that some of the schools are really changing, but go back to before that and they need great teachers, but he schools are like crazy or like, some of these schools make you teach to the test or you have to get their test scores up. And then, that's not the kind of teaching I want to do, is teaching to the test. So it's a huge, the schools that you are most likely to get the most freedoms and be the most progressive are the schools that don't necessarily need you as much. And I think and just a little bit I'm feeling like, I think Haverford, like it has a lot of Title 1 schools. There are, like people forget, like my dad was like, "You're interviewing in Title I school?" And I was like, "Yes, Dad it's not all [name of wealthy city in Haverford]"

Jill: Yes, exactly, just cross University Boulevard

Laura: But I think that as a county it is fairly progressive because that's, at the time, I was looking at every school's website and seeing tons of Title I schools that just

from their websites seemed a little more progressive in their teaching and I think maybe the county, maybe the diversity of the county has that um, maybe that value comes from other places. So I think that is one benefit to the county that there is value on the more progressive teaching ideas, but still there are areas where you know, in Haverford County where they need you.

Jill: Right, so that must be hard, like you're choosing

Laura: Right. But you know I never really thought. I didn't. So I thought about this and then one teacher, and. I don't know. I think like when I was younger. I never expected, I didn't go into teaching necessarily because I wanted a certain population, I just really liked school, so I probably imagined being a teacher kind of like what I knew and what I grew up with. So, that's all I had thought about. Um, and, so this teacher, right at the very end, I was meeting with the reading specialist at Lakewood [Elementary School] one of the last days, and she said, "You know, I always wanted to work in a school where they need me. You know," and she's like, "And some of the areas in Eastern County, you go west in the county," she was saying, "These kids don't need their teachers. You know, their parents practically, they're home or they're just. They learn, they do. They're motivated." And she's like, "Lakewood isn't the lowest. It's not Title I, but then it's like, it's sort of like the bottom of the one above that." Um, and I was like that's interesting. I'd never thought much about that. Um, I think that if anybody asked me why I thought education, even before this, why I thought education was important, and I've kind of always noticed this inconsistency in like the back of my head, is that I would go off and talk about how education is important for all people and everybody needs it. So I have like this whole like more social justice, and this democratic view of, and those are my beliefs about, you know, education, but then that inconsistency in yet I'm not sure that I ever really pictured myself in doing that. I don't know why. I just never thought about it. I just always thought like I'd teach in I guess I have to say I always thought, I'd teach in a school you know more or less a neighborhood, or you know somewhere not too far away. And I think also I that is also part of the thinking that you know teaching would be a good balance of my life and you know you can have kids and like everything would sort of be all like nice and neat [laugh]

Jill: And you still feel this? It still feels like an inconsistency?

Laura: Yeah, like what I said. And I like when I look at schools like I want to teach somewhere that's um, even like Lakewood. Like, I really like the population at Lakewood a lot actually.

Jill: Why? What was it like?

Laura: In some ways, as a staff member it would be hard because a lot of the staff is from there and like everything is based around Lakewood. Like people grew up at Lakewood, like teachers did, and right in the neighboring schools, if they don't go to Lakewood already. And that would be very hard. But in terms of the population to work with, um, it's, I love the diversity, in that, and it's not the most diverse, but I love that like some schools are like we're diverse but were 99% Hispanic. Well, okay, it's a minority school, but it's not really a diverse school. And like Lakewood, is like, I know I looked this up at one point, but it's like 50 percent white, and then how many Asian, and Black and not so much Hispanic

actually. But you look at those classes and you see a mix, primarily actually white, Asian, and African-American. Um, and I love that, and I don't think that it's that easy to find a mix like that.... I like that a lot. And again the kids were not, it's not a wealthy area, and yeah, it's not a Title I, but there were kids there that need help. They didn't have every advantage.

Jill: I'm thinking back to what that teacher said. Do you feel like you would need to feel that way?

Laura: I guess that it'd be interesting to me once I started teaching. I think, I don't know, I don't know. I think right now for me, and this sounds terrible in some ways and it's a selfish thing because for me like it's something that I love to do and like I want to have freedom with it and I want to have independence in how I teach. And I'm doing it for the kids, I'm not doing it for myself, but it's, I want to be happy doing it. And there are some things that I don't want to sacrifice and I'm afraid that I would hate teaching. I don't want to go into a place where I would hate teaching. Like in the long run, I'm better off in a place where I have balance and am really happy and like go, like a TFA kind of thing, where I'm miserable and never want to teach again.

## References

- Allexaht-Snider, M., & Hart, L. (2001). Mathematics for all: How do we get there? *Theory Into Practice*, 40(2) 93-101.
- Alsup, J. (2006). *Teacher identity discourses: Negotiating personal and professional spaces*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Apple, M. W. (2004). Creating difference: Neo-liberalism, neo-conservatism, and the politics of educational reform. *Educational Policy*, 18(1), 12-44.
- Apple, M. W. (2007). Ideological success, educational failure?: On the politics of No Child Left Behind. *Journal of Teacher Education*, 58(2), 108-116.
- Artzt, A. (1999). A structure to enable preservice teachers of mathematics to reflect on their teaching. *Journal of Mathematics Teacher Education*, 2(2), 143-166.
- Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 3-32). San Francisco: Jossey-Bass.
- Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, 60(5), 497 -511.
- Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. *Journal of the Learning Sciences*, 13(1), 1-14.
- Beauchamp, C., & Thomas, L. (2009). Understanding teacher identity: An overview of issues in the literature and implications for teacher education. *Cambridge Journal of Education*, 39(2), 175-189.

- Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, 20(2), 107-128.
- Boyd, B., & Bargerhuff, M. E. (2010). Mathematics education and special education; Searching for common ground and the implications for teacher education. *Mathematics Teacher Education and Development*, 11, 54-67.
- Boylan, M. (2009). Engaging with issues of emotionality in mathematics teacher education for social justice. *Journal of Mathematics Teacher Education*, 12(6), 427-443.
- Britzman, D. P. (1993). The terrible problem of knowing thyself: Toward a poststructuralist account of teacher identity. *Journal of Curriculum Theorizing*, 9, 23-46.
- Britzman, D. P. (2003). *Practice makes practice: A critical study of learning to teach*. Albany, NY: SUNY Press.
- Britzman, D. P., & Pitt, A. J. (1996). Pedagogy and transference: Casting the past of learning into the presence of teaching. *Theory into Practice*, 35(2), 117-123.
- Brookhart, S.M. (2005). Teachers' grading practices: Meaning and values. *Journal of Educational Measurement*, 30(2), p. 123-142.
- Brown, T., & McNamara, O. (2005). *New teacher identity and regulative government*. New York: Springer.
- Bucholtz, M., & Hall, K. (2005). Identity and interaction: A sociocultural linguistic approach. *Discourse Studies*, 7(4-5), 585-614.
- Butler, J. (1993). *Bodies that matter: On the discursive limits of sex*. New York, NY: Routledge.

- Butler, J. (1999). *Gender trouble* (2nd ed.). New York, NY: Routledge.
- Carnegie Foundation for the Advancement of Teaching (2006). Negotiating the fifth-grade math curriculum: Compliance and revision. In *Inside Teaching: A living archive of practice*. Retrieved from [http://gallery.carnegiefoundation.org/collections/quest/collections/sites/hurley\\_mary/index.htm](http://gallery.carnegiefoundation.org/collections/quest/collections/sites/hurley_mary/index.htm).
- Chin, E., & Young, J. W. (2007). A person-oriented approach to characterizing beginning teachers in alternative certification programs. *Educational Researcher*, 36(2), 74-83.
- Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Schauble, L. (2003). Design experiments in educational research. *Educational Research* 32(1), 9-13.
- Cobb, P., Stephan, M., McClain, K., & Gravemeijer, K. (2001). Participating in classroom mathematical practices. *Journal of the Learning Sciences*, 10(1/2), 113-163.
- Cochran-Smith, M. (2005). No Child Left Behind: 3 years and counting. *Journal of Teacher Education*, 56(2), 99-103.
- Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of knowledge and practice: teacher learning in communities. *Review of Research in Education*, 24, 249-305.
- Cohen, J. (2008). "That's not treating you as a professional": Teachers constructing complex professional identities through talk. *Teachers & Teaching*, 14(2), 79-93.
- Collopy, R. (2003). Curriculum materials as a professional development Tool: How a mathematics textbook affected two teachers' learning. *The Elementary School Journal*, 103(3), 287-311.



- Cook-Sather, A. (2002). Authorizing students' perspectives: Toward trust, dialogue, and change in education . *Educational Researcher*, 31(4), 3-14.
- Cooper-White, P. (2008). Interrogating integration, dissenting dis-integration: multiplicity as a positive metaphor in therapy and theology. *Pastoral Psychology*, 57(1/2), 3-15.
- Corbin, J. & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3<sup>rd</sup> ed.). Thousand Oaks: Sage Publications.
- Crockett, M. D. (2008). *Mathematics and teaching: Reflective teaching and the social conditions of schooling*. New York: Routledge.
- Crockett, M. D., & Buckley, L. A. (2009). The role of collection in equity-centered mathematics professional development practices. *Equity & Excellence in Education*, 42(2), 169-182.
- Davies, B. (2000). Eclipsing the constitutive power of discourse: The writing of Janette Turner Hospital. In. E.A. St. Pierre & W.S. Pillow (Eds.), *Working in the ruins: Feminist poststructural theory and methods in education* (pp. 41-73). New York: Routledge.
- Davies, B., & Harre, R. (1990). Positioning: The discursive production of selves. *Journal for the Theory of Social Behavior*, 20(1), 43-63.
- de Freitas, E. (2008). Troubling teacher identity: Preparing mathematics teachers to teach for diversity. *Teaching Education*, 19(1), 43-55.

- de Freitas, E., & Zolkower, B. (2009). Using social semiotics to prepare mathematics teachers to teach for social justice . *Journal of Mathematics Teacher Education*, 12(3), 187-2003.
- Delpit, L. (1996). *Other people's children: Cultural conflict in the classroom*. New York: New Press.
- Derrida, J. (1978). *Writing and difference* (A. Bass, Trans.). Chicago: University of Chicago Press. (Lecture delivered 1966).
- Dewey, J. (1933/2008). How we think: A restatement of the relation of reflective thinking to the educative process. In J.A. Boydston (Ed.), *John Dewey: The later works, Volume 8:1933, Essays and How we think, Revised edition* (pp. 105-156). Carbondale: Southern Illinois University Press.
- Diamond, J. & Spillane, J. (2004). High-stakes accountability in urban elementary schools: Challenging or reproducing inequality? *Teachers College Record*, 106(6), 1145-1176.
- diSessa, A., & Cobb, P. (2004). Ontological innovation and the role of theory in design experiments. *Journal of the Learning Sciences*, 13(1), 77-103.
- Drake, C. (2006). Turning points: Using teachers' mathematics life stories to understand the implementation of mathematics education reform. *Journal of Mathematics Teacher Education*, 9(6), 579-608.
- Ellis, M (2008). Leaving no child behind yet allowing none too far ahead: Ensuring (in)equity in mathematics education through the science of measurement and instruction, *Teachers College Record*, 110(6), 1330-1356.

- Ellsworth, E., & Miller, J. L. (1996). Working difference in education. *Curriculum Inquiry*, 26(3), 245-263.
- Ensor, P. (2001). From preservice mathematics teacher education to beginning teaching: A study in recontextualizing. *Journal for Research in Mathematics Education*, 32(3), 296-320.
- Ernest, P. (2004). Images of mathematics, values and gender: A philosophical perspective. In B. Allen & S. Johnston-Wilder (Eds.), *Mathematics education: Exploring the culture of learning* (pp. 11-25). New York: Routledge Falmer.
- Erickson, F. (2004). *Talk and social theory: Ecologies of speaking and listening in everyday life*. Cambridge: Polity Press.
- Erikson, E. H. (1959). *Identity and the life cycle*. New York, NY: International Universities Press.
- Evans, K. S. (2001). Will you still play with me if I stop making nice? Conflicting discourses in collaborative feminist literacy research, *Journal of Literacy Research*, 33(1), 99-136.
- Fairbanks, C. M. & LaGrone, D. (2006). Learning together: Constructing knowledge in a teacher research group. *Teacher Education Quarterly*, 33(3), 7-25.
- Fenstermacher, G., & Soltis, J. (1986). *Approaches to teaching*. New York, NY: Teachers College Press.
- Fine, M. (1994). Dis-stance and other stances: Negotiations of power inside feminist research. In A. Gitlin (Ed.), *Power and method: Political activism and educational research* (pp. 13-35). New York: Routledge.

- Foucault, M. (1980). *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977* (C. Gordon, Trans.). New York: Pantheon.
- Fontana, A., & Frey, J. H. (2008). The interview: From neutral stance to political movement. In N. K. Denzin & Y. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (3rd ed., pp. 115-159). Thousand Oaks, CA: Sage Publications.
- Freire, P. (2000). *Pedagogy of the oppressed* (30<sup>th</sup> Anniversary ed.). New York: Continuum International Publishing Group.
- Fuson, K. C., Kalchman, M., & Bransford, J. D. (2005). Mathematical understanding: An introduction. In Donovan, M. Suzanne & J. D. Bransford (Eds.), *How students learn: History, mathematics and science in the classroom*. (pp. 215-256). Washington, DC: National Academies Press.
- Gates, L. (2011). A cartographic exploration of collaborative inquiry as a professional development model for art educators. (Doctoral dissertation).
- Gee, J. (1996). *Social linguistics and literacies: Ideology in discourses* (3rd ed.). London: Falmer.
- Gellert, U. (2000). Mathematics instruction in safe space: Prospective elementary teachers' views of mathematics education. *Journal of Mathematics Teacher Education*, 3(3), 251-270.
- Giroux, H. (Ed.) (1991). *Postmodernism, feminism and cultural politics: Redrawing educational boundaries*. Albany: State University of New York Press.
- Goodman, J. (1988). The political tactics and teaching strategies of reflective, active preservice teachers. *Elementary School Journal*, 89(1), 23-41.

- Gutierrez, R. (2007). (Re)Defining equity: The importance of a critical perspective. In N. S. Nasir & P. Cobb (Eds.), *Improving access to mathematics: Diversity and equity in the classroom* (pp. 37-50). New York, NY: Teachers College Press.
- Gutiérrez, R. (2009). Embracing the inherent tensions in teaching mathematics from an equity stance. *Democracy & Education*, 18, 9-16.
- Hammerness, K. (2003). Learning to hope, or hoping to learn?: The role of vision in the early professional lives of teachers. *Journal of Teacher Education*, 54(1), 43-56.
- Hammerness, K., Darling-Hammond, L., & Bransford, J. (2005). How teachers learn and develop. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 358-389). San Francisco: Jossey-Bass.
- Harre, R. & Van Langenhove, L. (1991). Varieties of positioning. *Journal for the Theory of Social Behavior*, 21, 393-408.
- Hawley, W. D. & Valli, L. (2007). Design principles for learner-centered professional development. In W. D. Hawley (Ed.), *The keys to effective schools: Educational reform as continuous improvement* (second edition, pp. 117 – 138). Thousand Oaks, CA: Corwin Press.
- Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, 58(1), 47-61.
- Hill, H. C., Ball, D. L., & Schilling, S. G. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education*, 39(4), 372-400.

- Hill-Collins, P. (2000). What's going on? Black feminist thought and politics of postmodernism. In E.A. St. Pierre & W.S. Pillow (Eds.), *Working in the ruins: Feminist poststructural theory and methods in education* (pp. 41-73). New York: Routledge.
- Holland, D., Lachicotte, W., Skinner, D., & Cain, C. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.
- Horn, I. S. (2007). Fast kids, slow kids, lazy kids: Modeling the mismatch problems in math teachers' conversations. *Journal of the Learning Sciences*, 16(1), 37-79.
- Horn, I. S. & Little, J.W. (2010). Attending to problems of practice: Routines and resources for professional learning in teachers' workplace interactions. *American Educational Research Journal*, 47(1), 181-217
- Horn, I. S., Nolen, S. B., Ward, C., & Campbell, S. S. (2008). Developing practices in multiple worlds: The role of identity in learning to teach. *Teacher education quarterly*, Summer, 61-72
- Howard, G. (2006). *We can't teach what we don't know: White teachers and multiracial schools*. New York: Teachers College Press.
- Howard, T. C. & Aleman, G. R. (2008). Teacher capacity for diverse learners: What do teachers need to know? In M. Cochran-Smith, S. Feiman-Nemser, D. J. McIntyre & K.E. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts*. (3<sup>rd</sup>) (pp. 157-174). New York: Routledge.
- Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, 38(3), 499 -534.

- Jackson, A. Y. (2001). Multiple Annies: Feminist poststructural theory and the making of a teacher. *Journal of Teacher Education*, 52(5), 386-397.
- Kamberelis, G., & Dimitriadis, G. (2008). Focus groups: Strategic articulations of pedagogy, politics and inquiry. In N. K. Denzin & Y. Lincoln (Eds.), *Collecting and interpreting qualitative materials* (3rd ed., pp. 375-402). Thousand Oaks, CA: Sage Publications.
- Katz, P., McGinnis, J. R., Hestness, E., Riedinger, K., Marbach-Ad, G., Dai, A., Pease, R. (2011). Professional identity development of teacher candidates participating in an informal science education internship: A focus on drawings as evidence. *International Journal of Science Education*, 33(9), 1169-1197.
- Kazemi, E., & Franke, M. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. *Journal of Mathematics Teacher Education*, 7(3), 203-235.
- Kumashiro, K. K. (2000). Toward a theory of anti-oppressive education. *Review of Educational Research*, 70(1), 25-53.
- Ladson-Billings, G. J. (1999). Preparing teachers for diverse student populations: A critical race theory perspective. *Review of Research in Education*, 24, 211-247.
- Lather, P. (2008). Getting lost: Critiquing across difference as methodological practice. In K. Gallagher (Ed.), *Methodological dilemma: Creative, critical and collaborative approaches to qualitative research* (pp. 219-231). New York: Routledge.

- Layton, L. (2000). Trauma, gender identity, and sexuality: Discourses of fragmentation. In P. L. Rudnytsky & A. M. Gordon (Eds.), *Psychoanalyses/feminism* (pp. 211-228). Albany: State University of New York Press.
- Liston, D., Whitcomb, J., & Borko, H. (2009). The end of education in teacher education: Thoughts on reclaiming the role of social foundations in teacher education. *Journal of Teacher Education*, 60(2), 107-111.
- Little, J. W. (2002). Locating learning in teachers' communities of practice: Opening up problems of analysis in records of everyday work. *Teaching and Teacher Education*, 18, 917-946.
- Llewellyn, A. (2009). 'Gender games': a post-structural exploration of the prospective teacher, mathematics and identity. *Journal of Mathematics Teacher Education*, 12(6), p. 411-426.
- Lortie, D. C. (1975). *Schoolteacher*. Chicago, IL: University of Chicago Press.
- Lowenstein, K. L. (2009). The work of multicultural teacher education: Reconceptualizing White teacher candidates as learners. *Review of Educational Research*, 79(1), 163-196.
- Lubienski, S. T. (2003). Celebrating diversity and denying disparities: A critical assessment. *Educational Researcher*, 32(8), 30-38.
- Luehmann, A. L. (2007). Identity development as a lens to science teacher preparation. *Science Education*, 91, 822-839.
- Luke, C. (1992). Feminist politics in radical pedagogy. In C. Luke & J. Gore (Eds.), *Feminisms and critical pedagogy* (pp. 25-53). New York: Routledge.



- MacLure, M. (1993). Arguing for yourself: Identity as an organizing principle in teachers' jobs and lives. *British Educational Research Journal*, 19(4), 311-322.
- Martin, D. B. (2003). Hidden assumptions and unaddressed questions in *Mathematics for All* rhetoric. *The Mathematics Educator* 13(2), p. 7-21.
- Martin, D. B. (2007). Mathematics learning and participation in the African American context: The co-construction of identity in two intersecting realms of experience. In N. S. Nasir & P. Cobb (Eds.), *Improving access to mathematics: Diversity and equity in the classroom* (pp. 146-158). New York, NY: Teachers College Press.
- Martin, R. J., & Van Guten, D. M. (2002). Reflected identities: Applying positionality and multicultural social reconstruction in teacher education. *Journal of Teacher Education*, 53(1), 44-54.
- Marsh, M. M. (2002). Examining the discourses that shape our teacher identities. *Curriculum Inquiry*, 32(4), 453-469.
- Mauthner, N.S. & Doucet, A. (2003). Reflexive accounts and accounts of reflexivity in qualitative data analysis. *Sociology*, 37(3), 413-431.
- McIntosh, P (2007). In P.S. Rothenberg (Ed.), *Race, class and gender in the United States: An integrated study (7<sup>th</sup> Ed)*. (pp. 177-182). New York: Worth Publishers.
- McLaren, P. (2003). Critical pedagogy: A look at the major concepts. In A. Darder, M. Baltondano, & R. D. Torres (Eds.), *The critical pedagogy reader* (pp. 69-96). London: Taylor & Francis.
- McMillan, J.H., Myran, S., & Workman, D. (2002). Elementary teachers' classroom assessment and grading practices. *Journal of Educational Research*, 95(4), 203-213.

- Mendick, H. (2005). A beautiful myth? The gendering of being/doing 'good at maths'. *Gender and Education*, 17(2), 203-224.
- Moore, A., Edwards, G., Halpin, D., & George, R. (2002). Compliance, resistance and pragmatism: The (re)construction of schoolteacher identities in a period of intensive educational reform. *British Educational Research Journal*, 28(4), 551-565.
- National Council of Teachers of Mathematics (NCTM). (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: Author.
- National Council of Teachers of Mathematics (NCTM). (2000). *Principles and standards for school mathematics*. Reston, VA: Author
- National Mathematics Advisory Panel. (2008). *Foundations for success: The final report of the National Mathematics Advisory Panel*. (ED 00424P). Washington, DC: US Department of Education.
- Oakes, J. (2008). Keeping track: Structuring equality and inequality in an era of accountability. *Teachers College Record*, 110(3), 700-712.
- Olson, M. R., & Craig, C. J. (2009). "Small" stories and meganarratives: Accountability in balance. *Teachers College Record*, 111(2), 547-572.
- Peressini, D., Borko, H., Romagnano, L., Knuth, E., & Willis, C. (2004). A conceptual framework for learning to teach secondary mathematics: A situative perspective. *Educational Studies in Mathematics*, 56(1), 67-96.
- Pollock, M. (2001). How the question we ask most about race in education is the very question we most suppress. *Educational Researcher*, 30(9), 2-12.

- Pollock, M. (2008). *Everyday antiracism in education: Getting real about race in school*. New York: The New Press.
- Pollock, M., Deckman, S., Mira, M., & Shalaby, C. (2010). "But what can I do?": Three necessary tensions in teaching teachers about race. *Journal of Teacher Education*, 61(3), 211 -224.
- Ponte, J. P. D., & Chapman, O. (2008). Preservice mathematics teachers' knowledge and development. In L. D. English (Ed.), *Handbook of International Research in Mathematics Education* (2nd ed., pp. 223-261). New York, NY: Routledge.
- Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4-15.
- Rinke, C., & Valli, L. (2010). Making adequate yearly progress: teacher learning in school-based accountability contexts. *Teachers College Record*, 112(3), 645-684.
- Robertson, J. P. (1997). Fantasy's confines: Popular culture and the education of the female primary School teacher. *Canadian Journal of Education / Revue canadienne de l'education*, 22(2), 123-143.
- Rodgers, C.R. (2002) Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842-866.
- Rodgers, C.R. & Scott, K.H. (2008). The development of the personal self and professional identity in learning to teach. In M. Cochran-Smith, S. Feiman-Nemser, D. J. McIntyre & K.E. Demers (Eds.), *Handbook of research on teacher*

- education: Enduring questions in changing contexts (3<sup>rd</sup>)* (pp. 732-760). New York: Routledge.
- Ronfeldt, M., & Grossman, P. (2008). Becoming a professional: Experimenting with possible selves in professional preparation. *Teacher Education Quarterly*, 35(3), 41-60.
- Sachs, J. (2005). Teacher education and the development of professional identity: Learning to be a teacher. In P. Denicolo & M. Kompf (Eds.), *Connecting policy and practice: Challenges for teaching and learning in schools and universities* (pp. 5-21). Oxford: Routledge.
- Sandoval, W.A. (2004). Developing learning theory by refining conjectures embodied in educational designs. *Educational Psychologist*, 39(4), 213-223.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Aldershot Hants, UK: Avebury.
- Secada, W. G. (1989). Educational equity versus equality of education: An alternative conception. In W. G. Secada (Ed.), *Equity in education* (pp. 68-88). New York: Falmer.
- Selwyn, D. (2007). Highly quantified teachers: NCLB and teacher education. *Journal of Teacher Education*, 58(2), 124-137.
- Sleeter, C. (1997). Mathematics, multicultural education, and professional development. *Journal for Research in Mathematics Education*, 28(6), 680-696.
- Sleeter, C. (2008a). Equity, democracy, and neoliberal assaults on teacher education. *Teaching and Teacher Education*, 24(8), 1947-1957.

- Sleeter, C. (2008b). Preparing White teachers for diverse students. In M. Cochran-Smith, S. Feiman-Nemser, D. J. McIntyre & K.E. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts*. (3<sup>rd</sup>) (p. 559-582). New York: Routledge.
- Soreide, G. E. (2006). Narrative construction of teacher identity: Positioning and negotiation. *Teachers & Teaching*, 12(5), 527-547.
- St. Pierre, E. A. (2000). Poststructural feminism in education: An overview. *International Journal of Qualitative Studies in Education*, 13(5), 467–515.
- Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social Psychology Quarterly*, 63(3), 224-237.
- Stinson, D. (2004). Mathematics as “gate-keeper” (?): Three theoretical perspectives that aim toward empowering all children with a key to the gate. *The Mathematics Educator*, 14(1) 8-18.
- Stinson, D. & Powell, G. (2009). Teachers reflecting differently: Deconstructing the discursive teacher/student binary. In Swars, S. L., Stinson, D. W., & Lemons-Smith, S. (Eds.). *Proceedings of the 31 annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. (p. 320-327). Atlanta, GA: Georgia State University.
- Stinson, D. & Powell, G. (2010). Deconstructing discourses in a mathematics education course: Teachers reflecting differently. In M. Walshaw (Ed.), *Unpacking pedagogy: New perspectives for mathematics* (pp. 201-222). Greenwich, CT: Information Age Publishing.

- Stryker, S. (1968). Identity salience and role performance: The relevance of symbolic interaction theory for family research. *Journal of Marriage and the Family*, 30(4), 558-564.
- Tajfel, H. (1982). Social psychology of intergroup relations. *Annual Review of Psychology*, 33, 1-39.
- Tetrault, M. K. T. (2004). Classrooms for diversity: Rethinking curriculum and pedagogy. In J. A. Banks & C. A. M. Banks (Eds.), *Multicultural education: Issues and perspectives* (5th ed., pp. 164-185). Hoboken, NJ: John Wiley & Sons.
- Thomas, L. & Beauchamp, C. (2011). Understanding new teachers' professional identities through metaphor. *Teaching and Teacher Education*, 27, p. 762-769.
- Thompson, C. L., & Zeuli, J. S. (1999). The frame and the tapestry: Standards-based reform and professional development. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 341-375). San Francisco: Jossey-Bass.
- Valenzuela, A. (1999). Subtractive schooling: U.S.-Mexican youth and the politics of caring. Albany, NY: State University of New York Press.
- Valli, L., Croninger, R. Chambilss, M., Graeber, A. Buese, D. (2008). *Test driven: High Stakes accountability in elementary schools*. New York: Teachers College Press.
- Van Zoest, L. R., & Stockero, S. L. (2008). Synergistic scaffolds as a means to support preservice teacher learning. *Teaching and Teacher Education*, 24(8), 2038-2048.
- Vare, J. W. (1995). Gendered ideology: Voices of parent and practice in teacher education. *Anthropology & Education Quarterly*, 26(3), 251-278.

- Vavrus, M. (2009). Sexuality, schooling, and teacher identity formation: A critical pedagogy for teacher education. *Teaching and Teacher Education*, 25(3), 383-390.
- Vygotsky, L. (1934/1986). *Thought and language* (A. Kozulin, Trans.). Cambridge, MA: MIT Press.
- Walkerdine, V. (1990). Difference, cognition, and mathematics education. *For the Learning of Mathematics*, 10(3), 51-56.
- Walshaw, M. (1999). An unlikely alliance: Mathematics education, poststructuralism and potential affirmation. *Mathematics Teacher Education and Development*, 1, 94-105.
- Walshaw, M. (2001). A Foucauldian gaze on gender research: What do you do when confronted with the tunnel at the end of the light? *Journal for Research in Mathematics Education*, 32(5), 471-492.
- Walshaw, M. (2004). Pre-service mathematics teaching in the context of schools: An exploration into the constitution of identity. *Journal of Mathematics Teacher Education*, 7(1), 63-86.
- Walshaw, M. (2010). Poststructuralism and ethical practice action: Issues of identity and power. *Journal for Research in Mathematics Education*, 41, 1-19.
- Watanabe, M. (2008). Tracking in the era of high-stakes state accountability reform: Case studies of classroom instruction in North Carolina. *Teachers College Record*, 110(3), 489-534.
- Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of Educational Research*, 79(2), 702-739.

- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity* (p. 318).  
Cambridge, UK: Cambridge University Press.
- Wilkenson, S., & Kitzinger, C. (2003). Constructing identities: A feminist conversation analytic approach to positioning in action. In R. Harre & F. Moghaddam (Eds.), *The self and others: Positioning individual and groups in personal, political and cultural contexts* (pp. 157-180). Westport, CT: Praeger.
- Williams, P. (1991). *The alchemy of race and rights: Diary of a law professor*.  
Cambridge, MA: Harvard University Press.
- Wilson, M., & Goldenberg, M. (1998). Some conceptions are difficult to change: One middle school mathematics teacher's struggle. *Journal of Mathematics Teacher Education*, 1(3), 269-293.
- Yin, R.K. (2003). *Case study research: Design and methods* (3<sup>rd</sup> Ed.). Thousand Oaks, CA: Sage Publications.
- Zorzi, W.F. (Writer), & Hemingway, A. (Director). (2006). Unto others [Television series episode]. In D. Simon & N. Kostroff (Executive Producer), *The Wire*. New York, NY: Home Box Office.